

TOOL BOX

Institutional setting of water institutions in
development, enforcement and implementation
of future water management plans

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Foreword

As countries begin adopting Integrated Water Resources Management (IWRM), second-order tasks become increasingly important. The repertoire of tools and techniques for planning and executing these tasks however, is not nearly so well developed or comprehensive as those used by more traditional practitioners in the water sector. This constitutes a major resource gap – one which GWP has been helping to fill since it launched its IWRM ToolBox several years ago. As the GWP's rationale for the ToolBox states: "IWRM places novel demands on the policymaker, operator and water user, but offers more comprehensive, efficient and powerful approaches than those tried hitherto."

Key second-order tasks under IWRM include service and infrastructure planning, system and resource modeling, institutional development and/or reform, financing, policy and law making, conflict resolution, stakeholder relations, public awareness, capacity building and knowledge sharing.

The IWRM ToolBox is already a well known instrument to support capacity building and to increase the capabilities of water professionals in approaching different aspects of water planning.

During the first phase of its existence, between 2000–2003, the ToolBox was used in the GWP Central and Eastern Europe (CEE) region in education and training activities tailored to address the IWRM planning processes. Driven by GWP Central Asia and Caucasus (CACENA) representative initiatives, ToolBox activities were then introduced into CACENA at the end of 2003. Based on the four-years of experience gained in CEE and CACENA, these activities included a series of training courses and seminars.

All the ToolBox training courses and seminars aimed to promote the application of IWRM practices. In addition, the CACENA water experts were interested in sharing CEE experience and lessons learned in implementing the new EU water legislation. The courses provided an extensive review of IWRM approaches including:

- water planning and water management
- translation of water policy into legislation
- integrating economics into water planning and policy
- public participation, negotiation of conflicts, awareness raising.

The first document arising from the ToolBox training activities, published in 2004, was devoted to IWRM in the context of the EU policy. This second publication summarizes the proceedings from the training course held in Batumi, Georgia in summer 2007, and deals with institutional arrangements, reforms of water and environmental institutions. The first part of the publication summarizes the presentations based on the Toolbox instruments. The second part deals with concrete examples of institutional arrangements and organization reforms over recent years in the CEE and CACENA regions.

I am sure the experience and lessons learned that are documented in this publication will support further initiatives to adopt and implement IWRM approaches to more sustainable water resources, development and use in the region.

James LENAHAN
GWP secretariat

1 Introduction

Achieving sustainable water resources management and effective delivery of water services depends on the broader governance system within a country. Governance in a broader context relates to the social, economic, administrative and political system, which determines to a large extent the ability to put IWRM into practice. Water governance refers to the political, administrative, economic and social systems that exist to manage water resources and services and is essential in order to manage water resources sustainably and provide access to water services for domestic or productive purposes.

Governance models must fit the prevailing social, economic and cultural particularities of a country, but certain basic principles or attributes are essential. The governance system should be accountable, efficient and responsive. The governance system should allow the participation of all stakeholders: government, civil society, and the private sector.

The principal water management problems that the basin stakeholders are confronted vary substantially. These challenges include pollution, urban development, scarcity, floods, intersectoral conflicts and many others.

IWRM at the basin level could involve a range of responsibilities and activities where several authorities and organizations have a stake. Also, integrated water resources management calls for a multidisciplinary approach and actions at different levels.

The types and functions of institutions involved in the water management issues are described in chapters 2 and 3. The experience gathered at the ToolBox workshop held in Georgia in summer 2007 is presented in chapter 4.

2 Characteristics of water management institutions

The nature of water management with its myriad of potential uses and users raises complex management issues. Traditionally countries have divided responsibilities for water management often based on a division of quality issues and those related to quantity. Quality issues are often assigned to ministries of environment and quantity issues to more economic oriented ministries such as agriculture or natural resources. However, global acceptance of the sustainable development principle means that the management of water must involve a broader number of variables in a more integrated manner than was previously the case.

Water organizational structures usually cope with general government structures, although there are many examples of basin scale rather than administrative set up.

Basin – scale organizations might differ in structure and type. They could be state companies, where the government agencies operate within nationally defined basin boundaries, others are variations as quasi-governmental commissions or non-governmental basin councils.

There are cases that water authorities allocate water to users, and others do not. Many but not all are responsible for water quality. Some operate dams, reservoirs and other physical facilities. The only function performed commonly by all is planning and coordination.

In reforming institutions for better governance, an assessment of existing institutional systems should be carried out first to understand who does what for whom, and to whom they are accountable. An institutional assessment should identify, for example, conflicting laws, duplication or lack of clarity of mandates for different organizations and jurisdiction of different tiers of authority – local, sub-regional, national and, increasingly, international. Determining what to reform and the sequence that reforms should take are critical to the success of the reform process. A key element is an access to information. Frequently, information is only available to a selected group of experts or officials.

Reform in institutions usually takes place in a general process of decentralization. The main objective is to improve efficiency in governance and increasing equity at local levels. However, common challenges to many forms of decentralization include:

- inadequate financing,
- paucity in skills, particularly with respect to management and supervision,
- resistance from those who benefit from the centralized structure,
- how to sustain interest in the participatory process for the long term.

ToolBox lessons learned

- Reforms should be done in a coherent and integrative way and suit the broader social and political policies of the country.
- Not all necessary reforms can be done at the same time – it is important to decide on priorities and a sequence of actions to suit those priorities.

- Reform is a dynamic, iterative process and the only certainty is change itself.
- Vested interests and special interest groups should be included in debates but decision-makers should avoid being 'captured' by special interest groups.
- In any reform, regulation of service providers, both public and private, is a key element and regulators must be independent and strong.
- Reforms should avoid confusing the roles of resource management (government responsibility) and service provision (public or privately operated utilities).
- Governance for water must take account of all sectors dependent on or key providers of water and not just on drinking water supply.

3 Types of institutions involved in water resources management

3.1 Transboundary organizations for water resource management

Transboundary organizations provide a framework for managing water resources across international boundaries, where there are issues about the management of common (cross-jurisdiction) property resources.

Such organizations are often based on voluntary agreements between sovereign states, but may include international and intra-national water authorities and commissions. Traditionally, international organizations have been set up to address a given problem – navigation, flooding; but their remit can be and often has been expanded to tackle wider water problems in the basin. The type of agreement underlying these organizations varies greatly around the world, from ad hoc arrangements, memoranda of understanding, to formal international treaties and agreements.

It is clear that the effective functioning of transboundary organizations requires a secure funding base, the political will of governments, and the commitment of the partners who create them.

To develop the essential confidence to enable transboundary water resource management and collaboration, parties need to build and accept common data sets and knowledge about the water resource issues, and share visions about the future of the resource.

There are several options to organizing inter-ministerial bodies. The following key parameters must be considered:

- legal foundation,
- role,
- mandate,
- membership,
- source of funding.

The legal foundation addresses the issue of whether or not the organization has been established by law or policy. The role of the inter-ministerial organization may be either advisory or decision making. The mandate may be broadly based, for example, addressing issues related to sustainable development, or focused on a particular issue (i.e. in case of Danube basin it is the implementation of the EU Water Framework Directive). Membership addresses the issue of whether members are government officials, individuals from outside of government or a combination of those from inside and outside government. The source of funding for the inter-ministerial organization is also important and can differ depending mainly on legal foundation. While the factors may be analyzed independently they are in fact interrelated. For example, if the organization is to be a decision making body then the membership will be restricted to the decision making bodies within government.

ToolBox lessons learned

- Once established, transboundary organizations and water agreements are remarkably robust.
- Once established, transboundary water management needs to move beyond visions, and develop specific regulatory mechanisms, data and information sharing protocols and financing mechanisms to put transboundary water management firmly on the ground. Experience shows that technical secretariats are essential in this respect.
- The use of a respected external party or organization to act as broker is useful (multilateral agencies such as the UNDP and World Bank have both fulfilled these roles).
- Establishing the conditions for agreement can be time consuming and costly. Donor support can be helpful.
- National water policy needs to support inter-agency coordination for the transboundary organization and may need to be modified to align with the other parties to the agreement

Some 150 international – bilateral or multilateral – agreements exist in Europe and North America on the protection and use of transboundary waters¹. However not all of Europe’s transboundary waters are covered, and some of the agreements are outdated. Lessons can be learnt from the drawing-up and implementation of these agreements and arrangements as shown in the boxes below.

**BOX 1:
ToolBox case
study # 45**

Senegal – Establishing a transboundary organization for IWRM in the Senegal River basin

To address the problems and to realize the potential of the basin, the Senegal River Development Organization (OMVS) was established by the three of the four riparian states in 1972. The aims were to jointly:- (i) promote inter-country co-operation; (ii) co-ordinate technical, economic studies and other activities related to the Senegal river development such as navigation, irrigation, hydropower generation, environmental protection and conservation. (iii) regulate river flow for irrigation, navigation, flood control, power generation, domestic and industrial water supply and other purposes.

The Secretariat is financed jointly by the three countries following an agreed formula. Also the loans for the two dams are being repaid on a formula based on the proportion of benefits of the project to the three countries. Presently power is being generated. It is being supplied to Mali and it is about to reach Mauritania and Senegal. The irrigation is in the hands of local communities who are organized and assisted with finance and other facilities to carry out their farming activities.

**BOX 2:
ToolBox case
study # 306**

Danube: The Danube River Basin: A need for a cohesive international work in the region – Joint Danube Survey

Under auspices of this convention, the Joint Danube Survey (JDS) was launched. The JDS includes a series of scientific expeditions designed to explore a wide spectrum of multiple types of pollution in the whole reach of the Danube. The goal of this survey is to make a thorough analysis of water, sediments, river flora and fauna, as well as to check for as many polluting substances as possible. Collecting such a homogenous data set is helping to identify and confirm specific pollution sources and their pathways. Joint participation of all countries sharing the Danube River is also providing an excellent opportunity to exchange experiences and to harmonize the different monitoring procedures in use.

The Survey was made possible by the financial support of the German government and a large contribution from the Austrian government. In-kind contributions came from other Danube Basin countries, and all riparian states contributed their scientific, logistical, managerial and other necessary expertise to make JDS a truly joint enterprise.

¹ Senior Advisers to ECE Governments on Environmental and Water Problems, EEC for Europe, Bilateral and Multilateral Agreements and Other Arrangements in Europe and North America on the Protection and Use of Transboundary Waters (1993).

3.2 National apex bodies

Apex bodies consist of a range of entities such as high level steering groups within national governments, inter-agency task forces (for specific purposes e.g. water pollution control), and international consortia for the management of water resources. The aim of such bodies is to provide structures for co-ordination between different organizations involved in water resource management. In some cases water policy and management is centered in a specific body of government but in many situations responsibility for water is shared between a number of bodies (e.g. ministries for irrigation, environment and public works) that may not be able to operate easily together. Here an apex body may provide a useful coordinating function. The role of an apex body depends on the economic, social and encompassing political issues, even more than on the technical IWRM issues.

ToolBox lessons learned

- Establishment of a successful apex or coordinating body can be a slow process, since it takes time for a new body to achieve legitimacy.
- The effectiveness of an apex body is linked to the specific political and historical context.
- For an apex body to function effectively, all the stakeholders who are involved in the functions under its jurisdiction need to develop commitment to it and ensure it has appropriate powers. Conflict management and awareness raising techniques are important here.

Brazil: The establishment of the Brazilian National Water Agency – ANA

In Brazil, each level of government (the Union, the States, the Federal District and the Municipalities) has the right to individually create its own legislation on nature conservation, soil and natural resources management, environmental protection and pollution control. This right enabled each of the 1989 State Constitutions and their supporting laws to establish policies and operating criteria for the management of water systems within each state, under the federal rules on environment and water resources.

This existence of a “double” administrative domain (Union and Federal) for Brazil’s water basins is seen as the main difficulty faced by the country as it seeks to implement its National Water Resources Policy, and the National Water Resources Management System (NWRMS). These require coordinated and complementary water management actions be taken by both Union and federal states. The need for such coordination poses a considerable challenge in the current national political context.

As a remedy to this situation, the National Water Agency of Brazil (ANA) was established in June 2000. ANA has taken on a number of management and coordination roles which make it an executive-regulatory agency. On the one hand it implements the NWRP and coordinates the NWRMS, while on the other, it grants and provides funds, and controls the use of water bodies in the federal domain, and arbitrates conflicts among their users. Among the most significant work of the Agency has been addressing Brazil’s major water resource problems; strategic river basin management planning; and the introduction of Integration Agreements for coordinated management.

ANA’s creation has brought about a general improvement of water resources management in Brazil, as the federal government now has an organization with a modern managerial structure, real authority and the wherewithal to implement the NWRP, coordinate the NWRMS, and manage the Union’s water uses.

The States have begun to count on more support from the federal government as they develop their water management structures; this new relationship has deepened their participation in the overall NWRMS. The signing of the new integration and cooperation agreements shows that a new paradigm has been created in managing water basins that fall within both State and federal domains.

BOX 3: ToolBox case study #158

3.3 River basin organizations

River basin organizations (RBOs) are specialized organizations dealing with the water resource management issues in a river basin, a lake basin, or across an important aquifer. These organizations are domestic, not transcending state boundaries. RBOs provide a mechanism for ensuring that land use and needs are reflected in water management – and vice versa. Experience has varied dramatically in the ability of these organizations to achieve IWRM. Their functions vary from water allocation, resource management and planning, to education of basin communities, to developing natural resources management strategies and programs of remediation of degraded lands and waterways. They may also play a role in consensus building, facilitation and conflict management.

Recent innovation has focused on IWRM approach rather than single sector approaches.

The form and role of a river basin organization is closely linked to its historical and social context. Varying opinions exist about the most effective scale of application: the success of a river basin organization may depend on such things as, the level of human and institutional capacity of the civil society, the degree to which water resources are developed, and climatic variability (arid versus temperate river basins, for example). The policy and legislative framework will govern the purpose and effectiveness of the RBO.

ToolBox lessons learned

Successful RBOs are supported by:

- an ability to establish trusted technical competencies;
- a focus on serious recurrent problems such as flooding or drought or supply shortages, and the provision of solutions acceptable to all stakeholders;
- a broad stakeholder involvement, catering for grassroots participation at a basin-wide level (e.g. through water forums);
- an ability to generate some form of sustaining revenue;
- the capacity to collect fees, and attract grants and/or loans;
- clear jurisdictional boundaries and appropriate powers.

BOX 4:
ToolBox case
study # 186

Thailand – Decentralization and the Development of River Basin Committees

During Thailand's economic development, water management sector became increasingly centralized, creating conflicts between existing water uses and users. In an attempt to resolve these conflicts and better management their water resources, Thailand has sought to develop a much more inclusive management process. This has resulted in the creation of River Basin Committees (RBC) that possess a wide ranging membership of water stakeholders. The RBC has a wide ranging membership including government employees, academics, and various water users, and is planned to be the institution that will be responsible for water resource management coordination and regulation of the river basin, and it is comprised of a broad range of membership ranging from government employees, academics, and various water users.

The actual decentralization and increased participatory approach has entailed a lengthy process. Through a series of consultative workshops beginning in 1999, stakeholder participation is now more strongly developed.

3.4 Regulatory bodies and enforcement agencies

Regulatory and enforcement bodies have an extremely important role in establishing and ensuring the effective application of tools for building IWRM. Their functions range from the allocation of water rights, environmental management related to water use, water quality, land use planning and financial management of water resources management by the state. Regulatory bodies also have a function in setting prices and performance standards for service providers (economic regulation). The actual function of regulatory and enforcement bodies should be set out in a clear legal framework reflecting water policies. In some cases the same body undertakes regulation and enforcement; in others there is a separation. Regulatory and enforcement agencies normally have a range of tools for enforcement – fines, taxes, penalties, withdrawal of permits and licenses etc.

Regulatory bodies and enforcement agencies may be financed through central government funds, or by user fees (e.g. pollution charges) or fines for non-compliance.

Their specific functions are determined by government policy on water resources management. They are usually in the government sector but may subcontract specific activities (e.g. monitoring and testing of samples) to non-governmental organizations including private companies. It is important that they can act without day-to-day political interference.

Effective capacity in regulation and enforcement is essential and this applies whether traditional regulatory instruments or innovative pricing and economic instruments are used. However, capacity in regulatory and enforcement bodies varies widely from region to region and stress on capacity building and support is essential. The legitimacy of the regulatory body is critical in ensuring compliance.

ToolBox lessons learned

Important priorities for enforcement and regulatory agencies include:

- Sufficient staff of adequate capability to enforce regulations (enforcement agencies) and make appropriate assessments about water management needs (regulatory bodies).
- Statutes which are practical, enforceable and are based on accurate knowledge of resource management and environmental impacts.
- Staff who are knowledgeable about good management practices and have appropriate scientific knowledge in water resources management.
- A sense of ownership on the part of stakeholders so that they accept the monitoring, enforcement and regulation procedures; ownership can be built through use of awareness raising techniques and participatory management.
- Adequate financial resources to support the staff and operations, and transparency in financial management, to minimise regulatory capture.
- Selecting meaningful indicators for technical, economic and social issues and appropriate benchmarks .
- A programme of legal education and awareness building – for the regulating parties and public at large – goes a long way towards putting legal instruments into practice and ensuring that the use of regulatory instruments is not limited to specialists.

3.5 Local authorities

Local authorities can play an important role in overseeing the implementation of IWRM activities both within their boundaries and within the local and regional watersheds. They act both as regulators and as service providers and have a role in raising finance. Despite varying levels of jurisdiction

over water services, local governments have both direct and indirect responsibility for the water security of their communities and their industrial base.

In the context of IWRM, local authorities affect the aquatic ecosystems through their energy supplies, land uses (including zoning and impermeable areas), point and non-point pollution, construction practices, public education, solid waste and urban drainage practices, among other areas. Improved integration of the efforts of all the relevant actors toward commonly accepted goals for their water resources is necessary to improve the quality of water bodies and the security of the watersheds and aquifers on which they depend.

The role of local authorities and governments in supporting IWRM is particularly strong where there are moves towards decentralization of planning and resource management. Local governments offer a strong forum for local participation, particularly through internationally recognized programs, such as Local Agenda 21 planning, and can be instrumental in providing information and supporting dialogue among stakeholders and policy makers .

Local governments have a variety of economic instruments available to them to influence the behavior of their citizens. These include rate structures and charges, fees for permits and other governmental services, special taxes and surcharges, incentives (such as bonuses and rebates) as well as fines and penalties. These economic instruments are complemented by a variety of regulatory instruments, such as by-laws, that local governments can use to influence the implementation of IWRM practices within their boundaries.

ToolBox lessons learned

- The influence of local governments is limited by their political remit and their financial resources – i.e. they can only be effective given an appropriate enabling environment for them.
- Local leadership is needed to initiate sustainable processes in communities.
- Public access to baseline information about the quality of local water resources and issues related to the long term water security of communities is essential for the public to be responsibly involved.
- Long-term planning initiatives need to be supplemented by concrete actions to retain stakeholders' interest. For example, local visions for improved stream corridors should be tied to local recognition and reward systems, volunteer water quality monitoring programs, tree planting and community river festivals. In a short term, such events allow provide proactive community members and industries with positive reinforcement from the community and their peers, increasing their longer-term commitment to the program.
- Changes to municipal policies are most effective when linked to concrete changes in official staff roles and responsibilities (such as through an environmental management system process).

BOX 5: ToolBox case study #275

Ruzinov Strkovec Lake – municipal revitalization initiative

The case describes how the partnership between the NGO and municipality resulted in a successful revitalisation of the local lake. Ten years ago, the lake was contaminated by illegal sewage pipes making it a source of annoying smell and putrescent products. In summer period, when the water level decreased, the polluted banks of the lake became a harbour for rats and mice and the lake surface was covered by algae. The lake was considered to be dying and dangerous for any use. The situation was regarded as critical, as the lake is located in the vicinity of human settlements and urban infrastructure facilities, such as hotels, schools, kinder gardens, and hospital.

Local municipality did not have the required knowledge base and capacity. The annual cleaning the lake did not bring sustainable results. It was beyond its capacity and expertise to revitalize the lake for benefit of both nature and the local population.

The NGO Association of Industry and Nature Protection (APOP) initiated and organised a project to both revitalize the lake and draw the attention of local people to its flora and fauna. Educational notice boards were installed describing the lake's life with its inhabitants: birds, water flowers, fish, cane grass, and phytoplankton. The result is the improved environmental quality of the lake, which has become an area used as a recreational area for people interested in activities such as fishing, boating, swimming, skating and relaxing. The lake has also become a haven for wildlife including scarce and protected birdlife. Regular monitoring of lake quality is conducted by the municipal authorities.

3.6 Service providers and IWRM

Service providers range from government departments and municipalities, public corporations, and private sector companies to community-based organizations, and farmers' groups. They are the providers of water to rural and urban communities for irrigation and water supply including drinking, industrial uses, etc. They may also provide sanitation, treatment, and pollution control services. In some cases, service providers may be natural resource management agencies which provide nature conservation or agencies providing reduction of vulnerability to natural hazards such as floods. Service providers may also be required to preserve hydrological balances and ensure resource sustainability.

The legal framework for service providers is set out in water legislation, which covers issues such as responsibilities and requirements. Less formal service suppliers (water vendors, farmers with water from private wells) may lie outside the formal legislative framework but can be essential for meeting local needs.

National IWRM policies determine the roles and responsibilities of the various levels of service provision and the way in which they can be used to develop an integrated cross-sectoral approach and such policies will be enforced through the appropriate regulatory bodies. Water users and providers should comply with agreed national and state standards of water use, conservation and health.

Organizations with water supply, sewerage, treatment and reuse functions are increasingly driven by the need to make efficiency gains: to do more with less water, to eliminate subsidies, incorporate externalities and minimize impacts, to recover costs of operation, maintenance and replacement of water and wastewater systems, and to transfer the cost of supply and treatment from the provider (usually government) to the consumer (citizens, private companies other government organizations and users).

ToolBox lessons learned

- The structure of service providers is linked to the social economic and political structures of the society.
- Efficient and equitable service delivery is more straightforward in a system of well defined property rights and obligations for water for all uses.
- Technical tools for ensuring good service provision include:
 - Systems of water pricing related to volume and timing, for all applications;
 - Periodic audits of the activities of the private and public sector regarding water resources management;
 - Transparent use of economic instruments;

- Management systems which secure best practice use and reuse of water resources while minimising off-site, groundwater, and downstream impacts on freshwater ecosystem services;
- Technical innovations can include increased efficiency in storage, conveyance and distribution of water and techniques for waste minimisation;
- Effective regulation and clear government policies.

BOX 6:
Toolbox case
study #110

Egypt: The role of water users' associations in reforming irrigation

Increasing the capacity of users, operators and managers require intensive training. Now in Egypt the new generation has accepted the concept of users' participation in the management and the MWRI has legalized the formation of water users' association. Of key importance, Water Users' Associations playing a major role in decision-making and the operation and maintenance of the pumps and mesqas by themselves, with minimal assistance from the Irrigation Advisory Service (IAS) staff. The fundamental change introduced by the irrigation improvement is to replace individual farmer pumping at multiple points along the mesqa (irrigation ditches) by collective single point pumping.

The case shows clearly the importance of building appropriate institutional structures in parallel to the introduction of technical changes, and sets the irrigation reforms in a broader policy context – eg general agricultural and economic liberalisation. It also illustrates the importance of testing and piloting programmes over several years as a basis for strong institutional structures.

3.7 Civil society institutions and community based organizations

Civil Society Institutions (CSIs), Non-governmental Organisations (NGOs) and Community-Based Organizations (CBOs) can play an important role in developing and communicating integrated water resource management policies.

There is a large variety of players under this banner – from local informal to more formalized community based organizations and NGOs. These organizations complement government activities and are involved in local level development, advocacy, and social mobilisation. They are important players and apart from their development work often provide a voice for the poor and marginal groups. However, there has been a proliferation of civil society and non-governmental organizations that, however well-meaning, are often non-accountable and may operate from a narrow self interest with no responsibility for the consequences of their actions. They are not and should not be taken as a substitute for government and government should not abdicate its responsibility.

Still, within this spectrum CBOs can play an important role in the management of local water resources, for example in the establishment of rainwater harvesting programmes, local water supply and sanitation or the management of fishery resources. They have shown considerable ability to advocate on behalf of nature and environmental protection. Also, they support an increase of awareness of the need for sustainable water management and mobilize local communities to get involved.

ToolBox lessons learned

- Collaboration between service providers and CBOs can strengthen community ownership' and build water management capacity at local level.
- Similarly, working linkages between CBOs and local government provide a strong structure, allowing local water management issues to be scaled up and it strengthening local regulatory capacity.

- It is important to think through which level is most workable and will create a portfolio of activities that justifies the existence of a permanent local organization. Micro-planning and resource mapping are useful instruments at CBO level.
- Civil society organizations representing either professional categories or interest groups are most effective in societies where there is a commitment to participation and consultation.
- There is a danger that unless CBOs are well structured they may be taken over by narrow and stronger interest groups.

Slovenia: Awareness raising through school programmes

In 1997, the Institute for Integral Development and Environment, a local NGO, initiated a vision for establishment of a green buffer zone along the river, which would provide recreational as well as ecological facilities for the community. The municipalities in the river basin have supported this proposal. Several round tables and workshops were organized to discuss the problems and possible solutions, which were well covered by local press. To increase the discussion on the problems educational activities for young children (from kindergartens and junior schools) with large public events were designed. Surprisingly, the activities with children became very effective tools in raising awareness about river related problems among the general public.

The case is a good example of how some of the concepts in IWRM can be used as key ideas for educational awareness raising campaigns that eventually increase the overall understanding of those concepts in a particular region.

**BOX 7:
ToolBox case
study # 4**

4 Case studies

4.1 Institutional arrangements required according to the Water Framework Directive

Identification of River Basin Districts (RBDs) is an important issue in the Water Framework Directive (WFD) and the first one Member States had to resolve. This task has been difficult or, at least understood in different ways, because there are certain key issues that specially need some type of guidance. The most important of these are basically as follows:

- Definition of RBDs,
- Assignment of ground waters shared by different RBDs,
- Assignment of coastal waters “to the nearest and most appropriate RBD”,
- Definition of international and cross-border river basin districts, and
- Identification of competent authorities in water management and planning.

The best model for a single system of water management is management by river basin – the natural geographical and hydrological unit – instead by administrative or political boundaries. Initiatives taken forward by the countries sharing the river basins Maas, Schelde or the Rhine have served as positive examples of this approach, with their cooperation and joint objective-setting across Member State borders, or in the case of the Rhine even beyond the EU territory.

While several Member States of the EU have already taken a river basin approach, this is at present not the case everywhere. For each river basin district – some of which will traverse national frontiers – a “river basin management plan” will need to be established and updated every six years.

The EU Member States, Norway and the EC have jointly developed a common strategy for supporting the implementation of the Water Framework Directive 2000/60/EC. The main aim of this strategy has been to allow a coherent and harmonious implementation. Focus is on methodological questions related to a common understanding of the technical and scientific implications of the Water Framework Directive. In order to help member states, the Guidance on the Identification of River Basin Districts has been published.

Identification of River Basin Districts in the EU Member States has been setup in provisions of the WFD – Article 3: “Member States shall identify the individual river basins lying within their national territory and [...] shall assign them to individual river basin districts. Small river basins may be combined with larger river basins or joined with neighbouring small basins to form individual river basin districts where appropriate.”

The purpose for setting up the administrative arrangements (River Basin Districts) is to “ensure that the requirements of the Directive for the achievement of the environmental objectives established under Article 4, and in particular all programmes of measures are coordinated for the whole of the river basin district” (Article 3, paragraph 4).

To this end, Article 3 provides for a number of concrete actions, in particular:

- the identification of river basin districts within the national territory (paragraph 1);
- the assignment of ground waters and coastal waters to the nearest or most appropriate river basin district (paragraph 1);
- the establishment of the appropriate administrative arrangements including the identification of an appropriate competent authority (paragraph 2). If more than one competent authority is designated for a river basin district, one competent authority shall be designated as a coordinating body in order to ensure coordination with all other authorities (Annex I, point (v)). Member States are able to make use of existing national or international bodies as competent authorities (paragraph 6);
- the establishment of international river basin district between Member States (paragraph 3) and an endeavor to establish an international river basin district where the hydrographical boundaries extend beyond the territory of the European Community (paragraph 5);

Thus, the EU Member States were required to identify the individual river basins lying within their national territory and, for the purposes of this Directive, shall assign them to individual River Basin Districts (the deadline was December 2003). Small river basins may be combined with larger river basins or joined with neighboring small basins to form individual River Basin Districts where appropriate. Where ground waters do not fully follow a particular river basin, they shall be identified and assigned to the nearest or most appropriate River Basin District. Coastal waters shall be identified and assigned to the nearest or most appropriate River Basin District or Districts.

Member States shall ensure the appropriate administrative arrangements, including the identification of the appropriate competent authority, for the application of the rules of this Directive within each River Basin District lying within their territory.

Member States shall ensure that a river basin covering the territory of more than one Member State is assigned to an international River Basin District. At the request of the Member States involved, the Commission shall act to facilitate the assigning to such international River Basin Districts.

Where a River Basin District extends beyond the territory of the Community, the Member State or 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. Member States shall ensure the application of the rules of this Directive within their territory. Member States may identify an existing national or international body as competent authority for the purposes of this Directive.

Identification of river basins requires the fulfillment of different tasks that can be approached in a step by step process:

First step: Preliminary delimitation. Definition of boundaries of main elements

Preliminary identification has to be refined joining small basins in order to create water resources management units at an appropriate scale, defining ground waters coastal waters and assigning them and main aquifers to the most appropriate River Basin District.

First task in the definition of River Basin districts should deal with the limits of river basins (except coastal waters) and main aquifers. The hydrographical concept of a river basin depends only on topographical conditions: “the area of land from which all surface run-off flows through a sequence of streams and, possibly, lakes into the sea at a single river mouth, estuary or delta”.

The problem of identifying river catchment boundaries and the actual extent of drainage networks from digital elevation data is only a technical problem that has been studied for many years and nowadays there are feasible and consistent approaches, mainly based in the use of Geographical Information System Tools.

Natural groundwater resources are stock in aquifers, which are permeable rock formations or unconsolidated deposits, mainly gravels, sands and silts. The limits of this formation are not always clear, but can be obtained from geological maps and field tests. Specific local studies are needed in all cases.

In any case, it is necessary to note that the definition of the aquifers is a real minimum requirement in order to define RBDs that has been faced in very few cases by Member States. Even though precise topological criteria are difficult, clear boundaries should be established in a similar way to those of the surface basins, i.e. using polygonal lines defined by co-ordinates and so on.

There is sufficient technical knowledge to obtain river basin limits from Digital Terrain Models using GIS tools. On the other hand main aquifers in Europe are not well known.

Clear aquifer boundaries should be established in a similar way to surface basins, i.e. using polygonal lines defined by co-ordinates and so on.

Second step: Rationalizing the topographic and geological delimitation and consideration of other than only physical information

Joining of small basins

If a river basin is sufficiently large and adjacent to other similarly large river basins, it is likely to be designated as a stand-alone, individual river basin district, even when there may exist different physical conditions within its own catchment area. The principles of natural unity of the hydrologic cycle and integrated water management do justify this approach. In case of small river basins, adjacent to larger ones, or of several neighbouring small basins, it will be advisable to combine or join them, respectively, to form river basin districts provided that their geographical size and functional characteristics do not hinder the development of an efficient water management.

This combination could be made joining similar basins, mainly considering the following criteria:

- Climatic: degree of humidity, evapotranspiration, sunshine hours, temperature, etc.
- Environmental: Bio-geographical regions, limits of faunistical populations, geological conditions, etc.
- Socio-economic: Population density, pre-eminence of the primary, secondary or tertiary economic sectors, linguistic differences, cultural differences, etc.
- Administrative: Regional, provincial or local boundaries, established and consolidated structures, etc.

In any case, it has to be noted that the aim is to combine river basins to form river basin districts in order to obtain some synergies and therefore advantages in the water resources management. In some cases, these can be considered only as a minor issue for achieving the objectives of the WFD and, in consequence, an excessive refinement in the consideration of criteria could not be worth while.

Assignment of shared ground waters between RBDs

Article 3.1 of WFD says that ...Where ground waters do not fully follow a particular river basin, they shall be identified and assigned to the nearest or most appropriate river basin district. According to this definition, shared ground waters must be assigned only to one RBD. This is an outstanding difference with respect to coastal waters, where WFD allows assigning them to more than one RBD.

The assignment of ground waters to a RBD will likely pose problems mainly in case of relatively important aquifers shared by two or more RBDs.

Different criteria can be used to assign a shared aquifer to one of the RBD involved could be:

- environmental aspects, as the existence of wetland connected to aquifers, etc
- pressures and impacts in each portion of aquifer (water use, groundwater quality, etc);
- water resources (recharge and discharge areas);
- surface area of the aquifer in each portion of RBDs.

Again it will be advisable to combine the different criteria in accordance with local circumstances. The assignment would be the result of the weighted combination of the different criteria.

Some difficulties of different types could be found to assign a shared groundwater to only one RBD. In those cases the management of shared aquifers could be carried out in its respective portion of territory by the different RBD authorities involved but establishing the appropriate co-ordination between them in order to reach an adequate groundwater management.

Delimitation of coastal waters

Article 3 of WFD requires that coastal waters shall be identified and assigned to the nearest or most appropriate river basin district or districts.

Once coastal waters have been identified, there is no doubt that the inclusion of them to a specific RBD is mainly the consequence of the effect of river discharges on the coastal aquatic environment. WFD states that coastal waters are assigned to the nearest or most appropriate district or districts. With this definition, it is taken into account that the plumes of pollution produced by river discharges can be driven by the coastal currents and/or the wind and they can affect to RBD different from the nearest one.

Designation of International RBDs

According to WFD Article 3 (3), Member States have to ensure that river basins covering the territory of more than one of them will be assigned to one international river basin district. Most Member States consider that the national parts of the international basins (e.g. Danube, Elbe, Meuse, Odra, Rhine, Scheldt, etc.) are parts of international river basin districts to be established and, in several countries, the national parts of these RBDs are designated respectively as separate single RBDs (e.g. the French or the German Rhine or Meuse "District"). However, the definition of the boundaries of the river basin districts (including groundwaters and coastal waters) will be a national decision, coordinated with the neighbouring countries, where necessary. At the same time, tiny cross-border portions of larger river basins do not necessarily have to be designated as a separate national RBD, even if this aggregate district must be considered international, according to the WFD, because of the tiny portion of the cross-border river basin (e.g. cross-border river basins in the Pyrenees combined to other RBDs, viz. North and Ebro in Spain).

Whether or not international RBDs will be formed, there are a great number of co-ordination arrangements, both bilateral and multilateral, in practically all cross-border river basins. These are likely to become the starting point of the future co-ordination arrangements required in the WFD. The large river basin commissions (Danube, Elbe, Oder/Odra, Rhine) include non MS countries (several candidate countries as well as Switzerland and Liechtenstein). There are no formal agreements, on the other hand, for cross-border rivers between GR and Albania, FYROM and Turkey.

Designation of competent authorities

The designation of competent authorities relies on the principle of subsidiarity. This task has been finished according to the WFD by the end of 2003.

The WFD requires Member States to set up the appropriate administrative arrangements in order to apply effectively the provisions of the Directive and achieve its objectives. However, the WFD provides flexibility for each Member State to decide how to best set up these administrative arrangements according to their own reality and needs. The implementation of WFD Article 3 does not necessarily entail a change in the distribution of competences among administrations within Member States, nor the creation of new river basin district administrative bodies. What in any case is necessary is to create the adequate co-ordination mechanisms in order to effectively deliver the WFD obligations.

Member States could have a single authority per basin with responsibilities for all functions and ecosystems or a decentralized model. If more than one authority is implied, appropriate coordination arrangements between different authorities are needed. The existing structures, in particular those that have proved their effectiveness, should be utilized when possible, in order to take profit of their experience and avoid unnecessary costs. To do this, it is necessary that they cover all the requirements completely on their own or through adequate complementary structures or co-ordination arrangements.

The set up of competent authorities (CA) is very diverse across the EU. All combinations have been found, including:

- one competent authority for one RBD,
- one competent authority for several RBDs and
- several competent authorities for one RBD.

The reasons for the different approaches are the differences in the national legal and institutional framework regarding water management, in using existing administrative structures and in the distribution of competences of water management within the Governments. In some Member States, in particular countries with a federal structure, water management falls at least partly under the competence of sub-national or regional authorities. Some governments shared the competence on water management equally between different ministries.

No Member State has designated an international body as competent authority for the implementation of the Water Framework Directive. However, in most cases, international bodies have been charged with the task of coordinating the implementation of the countries sharing the international RBD and to produce an internationally agreed overview report to complement the national reporting to the European Commission.

The situation with co-operation with non-EU Member State is less developed (with the exception of cooperation with Third countries in the Danube or the Rhine basins).

Experiences from EU Member States

According to findings of EC² the designation of river basin districts has mostly taken place on the basis of hydrogeographic boundaries. Only some smaller exceptions were found where some Member States have unilaterally decided to attribute smaller (sub-) river basins which drain in international river basin districts to a different national river basin district (e.g. Germany – Oderhaff).

The grouping of smaller river basins into a river basin district has been also applied in a meaningful way in those countries where there are many small catchments that often drain directly into the sea (e.g. in the UK) or where many islands occur (e.g. Greece). Only for Italy, the current grouping of river basins into river basin districts appears to be illogical and not necessarily in line with the WFD intentions. River basins which drain into the Tyrrhenian and Adriatic Seas have been grouped together. This is the case for the northern, central and southern Apennine river basin districts. Furthermore, all small river basins were grouped into large districts, with the exception of the Serchio which is much smaller than the other management units. Another concern is that the Serchio river basin district appears to divide the northern Apennine river basin district into two separate pieces, with the result that the Ligurian river basins are not contiguous with the rest of the northern Apennine RBD. No explanations have been provided for these decisions.

Most Member States have identified their international river basin districts and established some form of international cooperation. In some cases, highlights some RBDs as international which have not been officially notified by the Member States. This was done on the basis of information available to the Commission and is often the case where a very small part of the RBD is crossing the border (e.g. Adour-Garonne and Ebro) or where the neighbouring countries have not coordinated the boundaries of the cross-border river basins (e.g. Tornionjoki-Finland and Bothnian Sweden).

The overall results are satisfactory and all Member States have established the necessary structures and administrative arrangements. However, there is a significant difference between the Member States and some may still have to address some shortcomings to ensure that the administrative structure deliver the results under the WFD. In comparing the EU15 to EU10, it is noticeable that, on the basis of the assessment criteria, the new Member States have implemented the Article 3 in a more appropriate way. This may have to do with the fact that the new Member States had to align themselves with the Community acquis as part of the accession process. They seemed to have taken this opportunity to take the WFD as a guide for reforms. The EU15 Member States were more often struggling to re-direct their national setups which often had been in place for decades to meet the new challenges.

The roles of Competent Authorities according to WFD

In general, following functions should be assigned to competent authorities in order to be sure that the designated authorities are able to make the WFD work. These functions according to WFD are the following:

- Planning and implementing (Article 13 and related articles)
- Monitoring, (Article 8)
- Ensuring public participation processes (Article 14)
- Reporting (Article 15)
- Penalties (Article 23)

² Commission Staff Working Document Accompanying document to the Communication from the Commission to the European Parliament and the Council 'Towards Sustainable Water Management in the European Union' First stage in the implementation of the Water Framework Directive 2000/60/EC [COM(2007) 128 final][SEC(2007) 363].

Also the authorities must manage all kinds of ecosystems affected by the WFD, (Article 1):

- Aquatic ecosystems (including surface, coastal and ground waters)
- Terrestrial ecosystems directly depending on the aquatic ecosystems
- Wetlands directly depending on the aquatic ecosystems.

Integrated River Basin Management needs coordination

The nature of water management with its myriad of potential uses and users raises complex management issues. Traditionally countries have divided responsibilities for water management often based on a division of quality issues and those related to quantity. Quality issues are often assigned to ministries of environment and quantity issues to more economic oriented ministries such as agriculture or natural resources. However, global acceptance of the sustainable development principle means that the management of water must involve a broader number of variables in a more integrated manner than was previously the case. This is generally accomplished by implementing the principle of sustainable development as a common principle through the policies and programmes of all ministries involved in water management.

There are several options to organizing inter-ministerial bodies. Five key parameters must be considered:

- legal foundation,
- role,
- mandate,
- membership,
- source of funding.

The legal foundation addresses the issue of whether or not the organization has been established by law or policy. The role of the inter-ministerial organization may be either advisory or decision making. The mandate may be broadly based, for example, addressing issues related to sustainable development, or focused on a particular issue such as the implementation of the EU Water Framework Directive. Membership addresses the issue of whether members are government officials, individuals from outside of government or a combination of those from inside and outside government. The source of funding for the inter-ministerial organization is also important and can differ depending mainly on legal foundation. While the factors may be analyzed independently they are in fact interrelated. For example, if the organization is to be a decision making body then the membership will be restricted to the decision making bodies within government.

There is no one the best way to approach the issue of coordination. It depends upon what the goal of the coordination is, the previous experience with coordination in the country, and the expectations of the participants in the coordinating mechanism. The goal of the coordination will dictate the level of involvement and the number of participants. For example policy coordination requires high level coordination from a few key actors in the policy field. Whereas more concrete results will require the coordination and involvement of a larger number of actors from several ministries and agencies working on specific implementation issues. Generally speaking the higher the level of coordination the less frequent the meetings and often the more difficult it is to track tangible results. This does not mean that high level coordinating mechanisms are either unnecessary or ineffective. It simply means that they tend to give long term policy signals to the rest of the government system. Signals which take time to implement in complex government systems. Many countries had made some attempt at inter-ministerial coordination prior to this project. In most cases this was useful input into the next steps to successful coordination. Interestingly, while many previous attempts were viewed as less than successful, in no case did this lead the project participants that inter-ministerial

coordination could not or should not be implemented. Rather the previous experience provided guidance on what might be a more successful approach.

Secondly, Inter-Ministerial Coordination is an evolving situation. In virtually every country attempts had been made at some point to create a coordinating mechanism with greater or lesser success. The lessons learned from previous attempts are useful input into the development of subsequent more successful organization. Interestingly those which had experience with high level coordination approaches were looking for alternative approaches which would yield more concrete results. Similarly, where lower level approaches had been implemented there was generally a concern that their success would be limited by the lack of senior level support. This suggests that over time the situation will evolve where there is a number of interlocking mutually supportive at various levels of government organization to maximize the benefits of Interministerial coordination.

Thirdly, by emphasizing the importance of several sectors including agriculture, natural resources and industry in addressing environmental issues, involving both government and non-governmental bodies and the general public in the process and advocating holistic solutions including policy, programme and investment components.

Fourthly, in the process of establishing new inter-ministerial mechanisms existing and previous experience in the individual country should weigh heavily in the analysis. Previous experience both positive and negative conditions the responses of potential participants in the new organizational mechanism and therefore must be fully considered. Also, initiatives which fit the existing priorities, problems and structures are more likely to succeed than those which are developed in isolation. Inter-ministerial coordination is an organizational tool to implement key government policies related to sustainable development. It is important that as new programmes and policy initiatives are put in place that the inter-ministerial dimension is fully recognized and designed into implementation. A good example is the current concern over climate change which will require the involvement of a wide variety of ministries including economic development, energy, finance, housing, and transport to name a few.

Finally, careful consideration must be given to the level at which the organization will function within the Government system. Much of the literature advocates high level bodies however, while there are many examples that high level bodies can provide a strong signal of intent the higher the level the less often that it is likely to meet and when deliberations do take place they are to result in concrete actions.

Case study adapted from the EC reports.

4.2 Case study: The Convention for the Protection and Sustainable Use of the Danube River

The Danube River Basin is the second largest river basin in Europe after the Volga covering 801,463 km² and territories of 18 states including EU-Member States, Accession Countries and other states that have not applied for EU Membership. It lies to the west of the Black Sea in Central and South-eastern Europe. To the west and northwest the Danube River Basin borders on the Rhine River Basin, in the north on the Weser, Elbe, Odra and Vistula River Basins, in the north-east on the Dnjestr, and in the south on the catchments of the rivers flowing into the Adriatic Sea and the Aegean Sea.

The Danube rises in the Black Forest (Schwarzwald) in Germany at a height of about 1,000 m a.s.l. and receives its name at the confluence of Brigach and Breg in Donaueschingen. The Danube flows predominantly to the south-east and reaches the Black Sea after 2,780 km where it divides into 3 main branches, the Chilia, the Sulina, and the Sf. Gheorghe Branch. At its mouth the Danube has an average discharge of about 6,500 m³s⁻¹. The Danube Delta lies in Romania and partly in Ukraine and is a unique "World Nature Heritage". The entire protected area covers 675,000 ha including floodplains, and more than 600 natural lakes larger than one hectare, and marine areas. The Danube is the largest tributary into the Black Sea.

The Danube River Basin is characterized by an aquatic ecosystem with numerous important natural areas, including wetlands and floodplains. It is not only of a high environmental but also economic and social value. It supports the drinking water supply, agriculture, industry, fishing, tourism and recreation, power generation, navigation and the end disposal of waste water. A large number of dams, dikes, navigation locks and other hydraulic structures have been built throughout the region.

Like all major rivers of Europe, the Danube has been significantly altered and affected by human activities throughout history. Building large dyke systems for flood protection started in the 16th century in the Austro-Hungarian Monarchy and some old networks of drainage or irrigation systems still exist in all basins. The first major Danube regulation works started in 1830 in Upper Austria; the first hydro dam was built in 1927 at Vilshofen in lower Bavaria.

Today hydropower use and energy production vary substantially from country to country. Hydraulic works in the form of dams and reservoirs are found in all mountainous areas of the Danube basin, while most navigation canals, dykes and irrigation networks concentrate on the lowlands along the central and lower Danube. More than 80% of the length of the Danube is regulated, and over 700 dams and weirs have been built along its main tributaries. There is a chain of 59 dams in the upper Danube between the source and Gabčíkovo downstream from Bratislava (on average one dam every 16 km) and there are only three important free-flowing sections of the upper Danube left (Straubing-Vilshofen in Bavaria, the Wachau in Austria and Vienna-Bratislava).

Navigation has long been a traditional activity on the Danube, facilitating the region's economic development. Historically the Danube and some of its main tributaries, such as the Sava, have formed important trade routes across Europe. Ships can navigate the Danube from 2,411 km upstream all the way down to the Delta – for 87% of the river's total length – and can call in at 78 harbours located along the Danube between Kelheim and the Black Sea. The Black Sea itself is almost completely cut off from the world's other seas and ocean, and the Danube and its tributaries play an important role in connecting this area with the rest of the world. Three artificial waterways have been built on the Danube: the Danube-Tisza-Danube Canal in Northern Serbia, the Danube-Black Sea canal in Romania, and the Rhine-Main-Danube Canal. This latter canal system provides a link from the Danube to the North Sea.

Utilizing water resources within the Danube River Basin for important human activities, such as municipal ones, industry and agriculture, has resulted in changes in the hydrological systems of the Danube River and its tributaries. Problems of water quality and quantity have been created, including significant environmental damage and impaired quality of life, such as public health problems. During the period of centralized planning systems, central and eastern European countries failed to develop adequate environmental protection policies and subsequent measures to fully respond to the degradation of the river environment.

Beginning of transboundary cooperation

On 29 June 1994, in Sofia, Bulgaria, eleven of the Danube Riparian States (Austria, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Moldova, Romania, Slovak Republic, Slovenia, Ukraine) and the European Union signed the Convention on Cooperation for the Protection and Sustainable Use of the River Danube (short title: Danube River Protection Convention-DRPC).

The Convention is aimed at achieving sustainable and equitable water management in the Danube basin. The signatories have agreed on:

- conservation, improvement and the rational use of surface and ground waters in the catchment area
- control of the hazards originating from accidents involving substances hazardous to water, floods and ice-hazards
- to contribute to reducing the pollution loads of the Black Sea from sources in the catchment area.

The signatories agreed to co-operate on fundamental water management issues by taking all appropriate legal, administrative and technical measures to at least maintain and improve the current environment and water quality conditions of the Danube river and of the waters in its catchment area and to prevent and reduce as far as possible adverse impacts and changes occurring or likely to be caused.

On May 1998 the ninth signatory of the DRPC ratified the Convention. According to its Article 27 the Convention could therefore enter into force on October 22, 1998. At the present the DRPC has 18 contracting parties: the EU, Germany, Austria, the Czech Republic, Slovakia, Hungary, Slovenia, Croatia, Serbia and Montenegro, Bulgaria, Romania, Moldova, Ukraine, and Bosnia and Herzegovina.

Cooperation in the Danube River Basin had early precedents in the field of water management. The transboundary cooperation in the Danube River Basin based on the bilateral agreements or treaties has had a long tradition for many years. The cooperation started in the sixtieths years of the last century and has been dealing in generally with specific water management issues of the bilateral transboundary cooperation. The bilateral agreements are still in force and solve the problems and development in field of water management between the neighboring countries.

The Bucharest Declaration of 1985 brought the riparian countries together to take the first steps toward a transboundary water quality network in scope of the whole Danube River Basin, and by 1991 a convention protecting the Danube Basin was under development. Representatives of the Danube River Basin countries met in Sofia of that year, together with international agencies such as the European Commission, United Nations Development Program and the World Bank. Together, they established the Environmental Programme for the Protection of the Danube River Basin (EPDRB). The EU was asked as a neutral party to lead a task force, consisting of Danube country representatives, donors, international financial institutions as well as NGOs. The EU also provided financial and institutional support to the EPDRB.

International financial institutions were important in developing the EPDRB and later actively participated in the Task Force. The World Bank was instrumental in conceiving and planning the components of the programme and remained an active participant in the task force as well as in the early stages of programme implementation. The European Bank for Reconstruction and Development also provided valuable help. Bilateral donors such as USAID also joined the task force, eventually coordinating their own technical assistance in the Danube region. Getting started a Programme Coordination Unit (PCU) opened (in Vienna, 1992) to oversee the programme until the convention entered into force and the results were handed over to the new Secretariat. The PCU

was responsible for starting operation of the expert sub-groups in monitoring, emergency warning and data management. Additionally, the PCU organized methods for distributing information on programmes and activities, and established an effective NGO network in the basin. Danube Basin countries readily contributed facilities on a rotating basis. The coordination of their input via focal points was a major success factor of the programme. Country representatives came to regard the PCU as a major catalyst to their own actions to improve their policies, administration and methods to be adopted for initiating environmental improvements.

The cooperation agreement between the EU PHARE programme and UNDP/GEF to coordinate their activities and to jointly manage the PCU for the EPDRB was a successful model for the implementation of other transboundary water projects in the Black Sea, the Dnieper River and the Caspian Sea. A clear agreement to share responsibilities allowed the EU PHARE team members and UNDP/GEF-funded staff to plan the strategic direction and handle the administrative tasks of the PCU. While both groups had the same overall objective of improving the sustainable management of the Danube River Basin, activities were divided according to priorities. PHARE's activities reflected their priorities of promoting social, political and economic stability in the region; preparing non-EU countries for EU accession; establishing the operational and legal structures necessary for ratifying and implementing the Danube River Protection Convention; and filling knowledge gaps with applied research activities. UNDP/GEF's activities concentrated on their priorities of understanding the global and transboundary aspects of environmental problems; building capacity for environmental management; promoting NGOs and civil society as means for developing activities and ensuring transparency; and promoting an ecosystem approach.

The groups worked together on several programme activities, such as:

- wetland rehabilitation,
- sustainable agriculture,
- raising public awareness through Danube Watch and Danube Information System, and
- developing the Strategic Action Plan.

UNDP/GEF project "Pollution Reduction Programme" was a major international response to the degradation of surface and groundwater quality in the Danube River Basin and eutrophication of the Black Sea. To complete the project, a transboundary analysis was accomplished to obtain more complete knowledge of pollution loads and their effects in the Danube River Basin. Basic data was gathered from the National Reviews and from the National Planning Workshops.

Implementation of the DRPC

To provide a framework for regional cooperation under the Convention, an Interim International Commission and its Secretariat were constituted by a Declaration at the 1994 Sofia meeting. The Danube countries agreed to cooperate on the implementation of the Convention before it would formally come into force. The Strategic Action Plan (SAP) was a tool for this cooperation.

The Task Force of the EPDRB, which was established on a temporary basis, was requested to co-operate with the Interim International Commission and its Secretariat. According to the 1992 Work Plan, the PCU had transferred its data, studies and reports to the permanent Secretariat when it had been become operational. A memorandum for close co-operation between the Task Force of the EPDRB and the ICPDR was signed in 1995.

The members of the Task Force included senior representatives of the riparian countries, international organizations and governments, and non-governmental organizations (NGOs). The Task Force was chaired by the European Commission and meetings held twice a year (13 meetings in the period 1992-1998).

Several Sub-Groups were established by the Task Force such as:

- Accident Emergency Warning System (AEWS),
- Monitoring, Laboratory and Information Management Expert Group (MLIM),
- Financing Partners Sub-Group,
- Programme Management Sub-Group, etc.

After the Convention entered into the force the existing sub-groups became expert groups of the DRPC and the Task Force became Programme Management Task Force (PMTF) under the DRPC.

Organizational structure the Danube River Protection Convention

The main bodies established under the Danube River Protection Convention at that time were:

- Conference of the Parties- the highest level body under the Convention (DRPC). The main tasks are to provide the overall policy for the work under the Convention.
- International Commission for the Protection of the Danube River (ICPDR) – the main decision making body under the Convention. It meets in the Ordinary Meeting or Standing Group Meeting. A key task for the Ordinary is to approve the annual work programme and budget, while the Standing Group provides the management and co-ordination of activities under the Convention.
- Permanent Secretariat (established in Vienna, Austria) – support of the ICPDR and its subsidiary bodies. The Secretariat has served also the focal point for information about the implementation of the Convention.
- Expert Groups – the permanent Expert Groups established under the Convention were at the beginning of function of the ICPDR:
 - Emission Issues (EMIS/EG),
 - Monitoring, Laboratory and Information Management (MLIM/EG),
 - Accident Emergency Warning System (AEWS/EG),
 - Strategic and Legal Issues (SLI/EG).
 - Temporary ad-hoc Groups which could be established by the ICPDR to undertake specific time-limited tasks.
- The Programme Management Task Force (PMTF) was a special supporting body. The PMTF supports the practical implementation of action programmes, promotes priority environmental investments and helps to secure technical assistance for the Danube countries. Members of the PMTF were representatives of the contracting parties, international financing institutions and donors, and NGOs.

Current activities and mandates

The transboundary cooperation in managing Danube waters has been reinforced when the Water Framework Directive (WFD) was adopted by the European Union in 2000. The EU Member States are obliged to fulfill the WFD, which emphasizes using a river basin approach for managing water resources. However, all countries cooperating under the DRPC expressed their firm political commitment to support the implementation of the WFD in their countries and pledged to cooperate in the framework of the ICPDR to achieve a single; basin wide coordinated Danube River Basin Management Plan. The ICPDR provides the platform for coordination necessary to develop and establish a river basin management plan for the Danube River Basin. The WFD has added strength to the efforts to coordinate actions in support of integrated river basin management and created anew tool for the effective management of water resources.

To achieve good water status in the water bodies of the Danube region by 2015 and to ensure a sufficient supply of clean water for future generations, the Contracting Parties to the DRPC nominated the ICPDR as the coordination body for the development of a comprehensive management plan for the entire Danube river basin using the principles of the EU Water Framework Directive.

This process involves experts from industry and agriculture, and representatives from environmental and consumer organizations as well as the local and national authorities. The Danube river management plan is to be updated every six years according to EU legislation. The Danube River Basin Management Plan follows the ambitious deadlines set out in the EU Water Framework Directive.

The management plan aims to create a programme of measures to ensure that environmental objectives are met on time. The plan includes:

- a general description of the characteristics of the Danube river basin
- a summary of significant pressures and impacts of human activities on the status of surface water and groundwater
- a map of monitoring networks
- a list of environmental objectives
- a summary of the economic analysis of water use
- a summary of the programme of measures
- a summary of the public information and consultation measures taken in the river basin.

The commitments are carried out with regard to the further implementation of the EU WFD:

- the preparation of a coordinated Danube River Basin Management Plan by 2009 entailing agreed joint measures and setting the framework for more detailed plans at the sub-basin or national level;
- the development by 2006 in selected, major tributaries, of a sub basin approach which will complement the comprehensive and integrating efforts at the level of the entire basin;
- to improve by 2008 the characterization and analysis of Danube basin waters to ensure a better and reliable basis for the preparation, in 2009, of the River Basin Management Plan and associated programme of measures;
- to carry out a second Joint Danube Survey in 2007 (possibly including the navigable stretches of major tributaries) and using this survey as part of a Danube intercalibration exercise;
- to transform, by the end of 2006, the TNMN into a network compatible with the EU Water Framework Directive.
- in relation to the implementation of the Action Programme for Sustainable Flood Protection in the Danube River Basin:
 - to improve flood forecasting and early warning systems and to develop the interlink ages between national and regional systems;
 - to prepare flood action programmes for sub-basins; to create fora for the exchange of expert knowledge and the sharing of experiences;
 - to assess flood-prone areas and to evaluate flood risks – aiming inter alia at developing flood risk maps – as a tool for planning and communication, based on a recommendation to be elaborated as soon as possible by the ICPCR;
 - to develop a checklist for safety requirements for contaminated sites in flood-risk areas.

With accordance these commitments a new organizational structure of ICPDR has been introduced as indicated in the scheme.

Expert Groups

The River Basin Management expert group serves as a coordination and guidance body among others expert groups and is entrusted to carry out the following main tasks:

- Coordination of all tasks related to WFD implementation in the Danube River Basin District at the basin-wide level;
- Preparation of the draft Danube River Basin Management Plan 2009; coordination of and guidance for other ICPDR Expert Groups for all tasks related to the development of the river basin management plan;

- Development of a road map (2006 – 2009) for the preparation of the Danube River Basin Management Plan 2009;
- Preparation and coordination of the draft Programme of Measures for issues relevant on the basin-wide scale, including an analysis of the cost-effectiveness of measures;
- Ensure development and carrying out of the actions needed under the ICPDR Operational Plan to fulfill the WFD requirements for public information and consultation at the basin-wide scale;
- Coordination of all aspects related to hydro-morphology and developed by other expert groups with the aim of presenting an assessment framework for hydro-morphological pressures and impacts taking account the designation of heavily modified water bodies and a proposal for measures to be included in the Danube River Basin Management Plan;
- Coordination with flood protection expert group on all aspects of integration of “Danube River Basin Management Plan” and “Flood Action Programme”;
- Coordination of the reporting requirements under the WFD on the basin-wide scale, thereby taking into account the reporting tool of the EC, the “Water Information System for Europe” (WISE);

The Pressures and Measures expert group is dealing with:

- identification of the causes of pressures and promotes measures to address them;
- harmonization of the work of the ICPDR with the EU directives;
- pollution prevention and precautionary controls, including inventories of potential accident risk spots and old contaminated sites in areas liable to flooding.

The Monitoring and Assessment expert group is responsible for issues concerning surface water monitoring programmes in the Danube River Basin District and their use in fulfilling WFD monitoring requirements. The main task of this expert group comprises of:

- water quality assessment and classification;
- the operation of the Trans-National Monitoring Network and Analytical Quality Control;
- the operation of the Accident and Emergency Warning System;
- the communication of alarm/warning messages in the event of accidents.

The Trans-National Monitoring includes:

- Surveillance monitoring I – monitoring of surface water status;
- Surveillance monitoring II- monitoring of specific pressures – long term trends;
- Operational monitoring – of water bodies at risk.

The Expert Group on Flood Protection has been responsible for developing the Action Programme for Sustainable Flood Protection in the Danube River Basin and is currently overseeing its implementation at the national level.

Information Management and GIS expert group has developed the series of maps of the Danube River Basin and the Strategic Plan for a Danube River Basin GIS and is supporting the EG all activities related to the operation of the information system of the ICPDR.

Strategic Expert Group (ad hoc)- addresses administrative and legal matters arising from the implementation of the DRPC.

The Danube-Black Sea Joint Technical Working Group coordinates the work of the ICPDR and the International Commission for the Protection of the Black Sea, particularly aiming to reduce nutrient inputs into the Black Sea.

Lessons learnt

A few key achievements illustrate the success of ICPDR's work of cooperation in the Danube River Basin:

- Development of a cooperative strategy for setting up the Danube River Basin Management Plan
- Cooperation with stakeholder groups to build a common understanding of the sustainable use of the Danube
- Identification and facilitation of funding for 45 projects investing in waste water treatment plants
- Setting up a network of more than 75 water quality monitoring stations throughout the Danube River Basin
- Development of an Emission Inventory for pollution originating from municipalities, industry and agriculture
- Operation of a basin-wide Accident Emergency Warning System helping to reduce damage from accidental spills
- Assessment and reduction of potential accidental risk hotspots
- Preparation of the basin-wide Danube Flood Action Programme, which aims to reduce flood damage by improving flood forecasts and warnings, restoring natural flood retention features
- Launch of Danube Day on June 29: the inauguration in 2004 included more than 100 events held basin-wide to raise awareness and strengthen "Danube Solidarity".

The first main output of the joint efforts to implement the WFD in the Danube River Basin is the Roof Report 2004. This report presents the comprehensive characterization and analysis for the entire Danube River Basin, in which all 13 Danubian countries cooperating under the DRPC have participated. All countries of the Danube basin have committed themselves to develop jointly a Danube River Basin Management Plan by the end of 2009, and, as a first step, provide the required information for this report.

The ICPDR has carried out the Road Map for the Development of the DRBMP as a tool to identify the different steps toward the river basin management in the DRB. All the Experts Groups are involved in the process to develop the Joint Danube River Basin Management Plan are making effort to fulfill the commitment of the contracting parties.

In spite of these positive achievements the ICPDR is still facing to problems which would be the challenge for the future activities of all the contracting parties:

- Water quality in the Danube River Basin is greatly affected by the activities of over 81 million people
- Excessive nutrients are disturbing the ecological balance in the Danube and the Black Sea
- Cadmium, Lead, Mercury, DDT, Lindane and Atrazine are among the most serious pollutants contaminating the Danube River Basin
- More than 80% of the length of the Danube is regulated, and over 700 dams and weirs have been built along its main tributaries.

Case study adapted from the ICPDR sources.

4.3 Case study: Regional Cooperation on Water Management in Central Asia

Water in Central Asia is an object of competing interests and thus – by definition – a potential source of conflict. Contrary to predictions of the early 1990s, however, the Central Asian states have not resorted to violence in order to advance their water interests. Instead, they have managed their

differences by engaging one another in negotiations and information exchange; some institutionalized, some ad-hoc, and some last-minute.

In the last decade of Soviet rule, the key water management institutions were the republican water ministries, which managed water allocations and construction projects, and today remain the foundation for interstate water management (with some transformation by status and authority). In 1986-87 for operative water management along two main rivers two basin water organizations (BWOs) Amudarya and Syrdarya were established. The federal Soviet government conducted compensatory schemes to regulate trade-off between republics concerning agriculture, energy and other sectors. Thus, there was not any serious competition for water among the republics.

As the USSR collapsed, the Central Asian republics continued to rely on Soviet water legislation. Yet, their legal obligations were no longer enforceable as water management had become a matter of international, not federal, affairs. With the creation of the five independent states, the big number of former domestic river basins were now transboundary and water had been turned into a source of potential interstate disputes that had not only environmental, but also political and economic implications.

During the Soviet period, the Aral Sea Basin was managed as an integral economic unit. Economic priorities, defined by Moscow, dictated that water was allocated to optimise agricultural production and provision of hydroelectricity was a second priority. With independence this system broke down. Each country began to redefine its own economic priorities. They became acutely aware of their resource inputs and outputs and it became evident that their respective goals conflicted regarding water use (by volume and by schedule). Uzbekistan and Turkmenistan wanted to intensify agricultural production for which they were heavily dependent on water for irrigation. Yet, the majority of the water sources originated outside their borders (SPECA 2003). Kyrgyzstan and Tajikistan, meanwhile, would like to utilize water for electricity production and also expansion of agriculture. The scene was set for intense competition.

The potential conflicts were most pronounced for the populations living furthest downstream, especially Karakalpakstan and Kzyl Orda. Here the water was of very low quality consisting mainly of polluted drainage water that had been returned to the river. These populations had – and still have – little bargaining leverage over upstream users (agriculture users at midstream and hydropower users further upstream) because they lacked any resources needed by the upstream users. Midstream users were in better bargaining positions. Turkmenistan and Uzbekistan (and partially Kazakhstan) primarily needed water for agricultural production. The challenge was to keep water flowing from further upstream. Each of these three countries has large reserves of natural gas.

In sum, the benefits from cooperation were highly asymmetrical and unevenly distributed. It is largely due to the leadership of the water authorities from five countries and the support from the international community that major conflict did not erupt after independence.

Instead of engaging in violent conflict Central Asian states chose a far more cooperative stance. In order to avoid collapse of the agricultural sectors the countries extended the water management principles and quota systems inherited from the Soviet era. In February 1992, the five countries entered into agreement on Cooperation in the Joint Use and Protection of Water Resources of Interstate Significance, affirming the “existing structure and principles of allocation” of transboundary waters. By signing this agreement, the Central Asian states pledged “strictly to observe the coordinated procedures and established rules on use and protection of water resources,” while recognising the Aral Sea as of common interest to the five countries. The agreement also formed an Interstate Commission for Water Coordination (ICWC), which subsumed the two existing basin

water organisations, and was authorised to determine annual water consumption limits in accordance with actual water availability.

The following year the Interstate Council on the Aral Sea (ICAS) and the International Fund for Saving the Aral Sea (IFAS) were formed. Voicing and providing support, the international donor community soon endorsed this emerging institutional framework that comprised ICAS, IFAS, ICWC and associated organisations.

Why did the Central Asian countries choose to continue regional cooperation instead of promoting individual state interests? In short, because international organisations provided incentives for cooperation. International donors saw the Aral Sea crisis as an opportunity to link economic and political reforms with environmental and conflict issues. Fifteen to 20 international organizations have provided technical and financial assistance related to the Aral Sea at any one time since independence.

Initially these incentives were effective because the Central Asian states could no longer rely on Moscow to address the Aral Sea crisis. They needed financial and technical assistance to build new state institutions and join the international community of nation-states. In that regard, the World Bank's requirement for regional cooperation in order to receive aid worked as a critical inducement³.

The technical and financial assistance served as side-payments that provided compensation to different domestic constituencies, e.g., water and agriculture ministries, that otherwise could undermine the water sharing agreements. They also targeted the populations that were hardest hit by the Aral Sea crisis, thus ensuring lesser resistance to cooperation agreements.

Cooperation began to falter in the mid-1990s, because the Central Asian countries failed to agree on a comprehensive regional approach. In addition, the early agreements did not take into account new political realities and divergent economic interests. The upstream countries demanded increased water allocations, but the agreement did not allow for that⁴.

A donor community review of the ASBP (Phase 1) conducted in 1996 recommended major changes to the water management institutional framework. It suggested (a) stronger leadership by regional institutions as opposed to donor influence in program formulation and implementation; (b) increased political and financial commitment by Central Asian countries towards regional institutions; (c) clearer priority setting between national and regional tasks and more focus on real implemented activities; and (d) clarification of the roles of the various institutions.

Despite the clear recommendations, however, many of these challenges remain today. In 2002, for example, members of IFAS agreed that they would make a concerted effort to finance the operational costs for the Executive Committee and their joint activities (lack of financing had been a major recurrent problem), and called for the creation of a special UN Commission to co-ordinate the activities of regional organisations and donors for implementation of the agreed ASBP (Phase 2). However, until today no formal discussions have been undertaken among the states or with the UN Secretariat itself on the composition and role of a "special UN commission".

³ *The World Bank's Operational Policy 7.50 (OP 7.50) calls on riparian states to come to an agreement over projects that have an effect on each other. This is intended as an incentive for cooperation, but may also work as an obstacle for project implementation as one party may veto a project that benefits another. World Bank (1994).*

⁴ *The quotas for the Syr Darya river basin are: Uzbekistan (50.5 %); Kazakhstan (42 %); Tajikistan (7 %); Kyrgyzstan (0.5 %). The numbers reflect the share of total run-off in the main channel, tributaries not accounted. ICWC Bulletins.*

The international community and the Central Asian states were late to discover that interdependencies of the Soviet Union could be used to foster mutual cooperation. The Aral Sea crisis was viewed primarily as a water problem, not an opportunity for collaboration and economic development by trading energy for water. The first was the USAID, who managed to point the parties toward mutual gains by using an issue-linkage strategy and by excluding Turkmenistan, which historically has been the most resistant to outside interference in the Aral Sea basin. Central to a 1998 agreement on Syr Darya was the concept of compensation for energy losses from the upstream storage of water during the winter months (World Bank 2004). While there are several outstanding challenges in this barter system, it points to a more integrated and sustainable approach to regional cooperation⁵.

The management of water releases from the Toktogul reservoir on the Naryn River in Kyrgyzstan illustrates the water-energy nexus. Initially, after independence, the Central Asian states upheld the legacy interdependencies whereby Kyrgyzstan supplied both Uzbekistan and Kazakhstan with water during the summer months in return for gas and coal, respectively, during the winter months. This set-up was soon to be challenged. Whereas Toktogul was originally designed to meet irrigation demands downstream, Kyrgyzstan quickly saw the possibility of increased hydropower generation. Instead of storing the water for release during the spring and summer irrigation periods, the water could be released during the winter when the domestic need for electricity peaked.

During the Soviet era, power generation was regulated by pooling all hydro- and fuel-energy resources. Electricity demand and supply did not correspond to state borders. Instead, the hydropower resources of Kyrgyzstan and Tajikistan were used as the peak energy resources for Kazakhstan, Uzbekistan and Turkmenistan. Meanwhile, coal-fired, gas-and-oil-burning heat power plants met the Kyrgyzstan and Tajikistan basic power demands. Thus integrated and centrally designed, it was possible to operate an optimal schedule for energy and water management.

As Central Asia opened to world commodity markets in the mid-1990s, disagreements over the use of Toktogul emerged. Uzbekistan and Kazakhstan started to charge world market prices for gas, oil and coal exports to Kyrgyzstan. In response, as it faced energy shortages during the winter months and was unable to muster the hard currency for carbon imports, Kyrgyzstan began to operate the Toktogul power plant for electricity generation during a season where it traditionally had been storing water. The downstream countries experienced the negative effects of this in two ways. Firstly, there was less water available for irrigation during summer months. Secondly, the water released during the winter did not reach the Aral Sea, but was diverted to a local depression because the lower part of Syr Darya is frozen for much of the season⁶.

Today, Kyrgyzstan wants the downstream countries to contribute to the maintenance of the Toktogul reservoir and related infrastructure because these riparian are the main beneficiaries. Kazakhstan and Kyrgyzstan have agreed to such compensation within the Chu-Talas Commission. There may be room for similar mechanisms between Uzbekistan and Tajikistan with regard to Syr Darya.

As a result of the individual pursuit of self-sufficiency in water and energy, the countries have invested in costly solutions instead of adhering to the mutual interdependence of the water and energy systems⁷. The total sums spent on water infrastructure are not publicly available.

⁵ *The 1998 agreement was not exhaustive and, as a consequence, the parties had to continually negotiate the exact volumes of water releases and amount of compensation. During 2003-2005 the parties were not able to conclude annual agreements, likely due to increased precipitation which caused Uzbekistan to be not dependent on water from Kyrgyzstan.*

⁶ *Kazakhstan has subsequently resolved the latter problem by implementing a number of technical measures financed by World Bank loans.*

⁷ *Examples include construction of new reservoirs in Uzbekistan (Rezaksay and Amasay) and in Kazakhstan (Koksaray).*

The Review Team recommends that future water projects assess the total costs of water management policies striving for water independence versus cooperation, thereby providing documentation and incentive for either policy.

Forecasts indicate that 2008 may be the most critical ever in the Syr Darya basin. The capacity of the Toktogul water reservoir is expected to be close to “death level” by April 2008, thereby impacting both power generation and irrigation. This could provide further incentives for effective water and energy management.

As is shown above, the history of water management and disputes in Central Asia is the history of institutions. Some, like BWOs Amudarya and Syrdarya have been established in Soviet times on a river basin principle and still are carrying out operational functions of the water management. Some, like ICWC emerged immediately after the collapse of the union as an attempt to substitute federal water management (policy) authority.

Each country has established its own system of water management and over the years developed its own institutions that should carry out water management in the country and promote national interests in discussions with other countries of the region. Institutional and water governance systems of the other states are more or less similar, though would differ from each other with the names of the institutions, their subordination to the governmental authorities and mandates, level of influence, etc. E.g. WUA that are very well developed in Kyrgyz Republic and have an important role in settlement of local water related disputes are not that strong in Uzbekistan and Tajikistan yet and exist in Turkmenistan and Kazakhstan in different format.

Additionally to the institutions established by the countries themselves (e.g. ICWC), number of regional institutions has been established during last 16 years with support from IFI and international organisations. Furthermore several projects contributed substantially to the institutional landscape and influenced the present state of affairs in the water sector.

Though institution-building has become a trademark for Central Asian water management, most regional institutions are found wanting, however, as they continue to muddle through political and financial obstacles. The following could be mentioned among the main shortcomings:

- The lack of political commitment and agreed by the five countries guiding for the institutions agreements on the key water management issues, among others on water allocation principles and on cross border financial mechanisms for O&M and new investments;
- Level of decision making power and authority of ICWC and IFAS does not correspond to the functions that have to be performed;
- Lack of clear mandates, responsibilities and accountability of IFAS and its sub-bodies (especially in relation to inter-sectoral challenges);
- Failure of the donor community to fully engage EC-IFAS in preparation and implementation of projects;
- Lack of consensus between sub-bodies of IFAS (and national institutions) and donor agencies on Aral Sea Basin Programmes (ASBP);
- Inadequate funding by the states to cover core operational expenses of IFAS and its sub-bodies; No permanent location of EC-IFAS;
- Lack of unified donor stance on institutional issues, regional cooperation and transboundary water issues, national and regional water management and sustainable development policies and practices.
- Lack of proper coordination between water and energy sectors.
- Lack of mutual trust.

Not only each individual institution but also interrelations between them, coordination of their functions and duties would have to be reconsidered to make them capable of urging constructive negotiations on water and energy disputes and promote integration in the region.

Present hierarchy in the relations between main water governance institutions was agreed by the Head of States on 9 April 1999 (in Ashgabat). The agreement set up the following distribution of obligations between the regional organizations, which still is valid:

- Board of the International Fund for the Aral Sea (Board of IFAS), represented by Deputy Prime Ministers of five States – this is the highest political level for decision making and final approval of activities before (if needed) the Head of States;
- Executive Committee of IFAS – a permanent body, which is represented by 2 members from each State and carries out all activities for implementing decisions made by the Board of IFAS via the National Branches of IFAS. Also, EC-IFAS, on behalf of the Board could organize the Agencies or PMCU for different projects (international and donors) implementation;
- Interstate Commission for Water Coordination (ICWC) – the highest level of transboundary water resources management, water allocation, water monitoring, water use and preliminary proposals assessment for principal improvement and change of organizational, technical, financial, environment approaches and decisions related to water at the interstate level.
- BWOs, SIC ICWC and Secretariat – are executing bodies of the ICWC.

Regional cooperation is fostered through the establishment of an institutional framework for water management. In sum, while the institutional framework has allocated water every year, it is not perceived as efficiently managing the regional water resources.

Present interrelations between the key institutions in the fields of water and energy governance, their mandates, functions, obligations and duties are not fully responding to the actual requirements of the present situation. It has been criticised for its lack of clarity with respect to the functions of different organs of the same institution, for confusion between decision-making organs and executive organs, and for the duplication of functions between different institutions (Vinogradov 2002)⁸. This was also clearly stated at the OSCE conference in Tashkent on October 30, 2007 by Prof. Dukhovny⁹.

External evaluations of international projects supporting regional institutions generally show a low level of coordination despite many projects being similar. In the field of water, donors have focused on technical rather than political and economic solutions (ICG 2002b). In sum, external actors have been unable to significantly influence the basic attitudes and approaches of individual riparian states.

This lack of progress is due to several reasons: External actors have not maintained clear and consistent objectives; economic and strategic objectives often run counter to policies that encourage collective regional behaviour; Central Asian states are sceptical about foreign involvement in water management, in particular in downstream countries, which fear that new initiatives may strengthen the upstream countries political position.

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⁸ Vinogradov, S. (2002), "Managing Transboundary Water Resources in the Aral Sea Basin: In Search of a Solution", International Journal for Global Environmental Issues, vol. 1, nos. 3/4, pp. 345-361.

⁹ Dukhovny V. ICWC: achievements and challenges of the future – water cooperation on the way to sustainable development. SIC ICWC, Tashkent, 2007, 39p.

4.4 Case study: Reforming river basin organizations in Lithuania

History and evolution of water authorities and organizations

The embryos of state water protection management appeared at the time of the Lithuanian independence in 1918. There was no necessity for establishing a special institution because the pollution of lakes and rivers was not large. It was sufficient to control the consumption of natural resources. Forestry Department was in charge of forests and forestry administration, supervision and exploitation of state waters, and fish resources.

After the re-establishment of state independence, in 1990, an Environmental Protection Department was founded to implement state policy on the consumption of natural resources and environmental protection, including surface and ground waters. It had great powers and was accountable to the Supreme Council of the Republic of Lithuania. During the transition to market economy period when many polluting industries belonged to the relevant ministries and legislative system was not established yet such high position of the Environmental Protection Department was very efficient. It was able to apply quite strict administrative measures and other enforcement mechanisms and although decisions of the Department were not always favorable to water users, they, even if under the ministry, were not able to ignore requirements of the Department.

Later, when proper national legislative system was created and governmental institutions established it became clear that more efficient coordination of environmental and other economical activities could be done by the government. Therefore, in 1994, the Environmental Protection Department was reorganized into the Ministry of Environmental Protection. The Ministry of Environmental Protection was reorganized again in 1998 – it was merged with the Ministry of Construction and Urban Development. Since then it is called the Ministry of Environment (MoE). The Ministry of Environment with its subordinate institutions is the main ministry responsible for water management in Lithuania¹⁰.

Institutional Reform: Decisions and Actions Taken

Two main driving forces were responsible for legal and institutional reforms in water sector of Lithuania at the end of 20th century: transition to market economy and EU accession. Transition to a market economy was supported by a framework for privatization where during relatively short time most of the agricultural and industrial enterprises were privatized. In the beginning of the transition period water infrastructure problems were completely under the responsibility of the Government, later these problems have been transferred to local municipalities.

The EU approximation process in Lithuania has begun in 1997-98 and resulted in an integrated environmental approximation strategy, adopted in October 1998. This strategy formed the basis of all subsequent approximation work, assisted in completing gap analysis of Lithuanian water legislation as compared with EU requirements, as well as producing an institutional set-up. New legal acts have been developed and amendments to the existing legislation have been adopted. In order to fulfill the goals foreseen in Lithuanian strategic water management documents all main water management elements have been revised and improved. The water related legal system has been amended and institutions re-organized. Crucial role has been paid to the planning of significant investments into the water-related infrastructure. In order to ensure an efficient use of available funding sources, Lithuania has prepared many investment projects for wastewater collection and treatment facilities according to river basins. The Law on Water adopted in 2003 is containing main elements of IWRM.

¹⁰ Source: web page of the Ministry of Environment www.am.lt.

EU accession has caused that changes in political and administrative water management systems were directed towards optimisation of water governance in Lithuania, introducing the concept of IWRM and facilitating implementation of WFD requirements¹¹.

In September 2003, the River Basin Districts have been established and the Competent Authority – Environmental Protection Agency (EPA) responsible for their administration has been appointed. The EPA is responsible for establishment of water environmental objectives and elaboration of integrated basin management plans and programs of measures, encompassing different sectors influencing water quality. The EPA also shares the information on water management with stakeholders trying to involve them into water management process and the preparation of integrated basin management plans and programs of measures.

The Water Law further outlines the main components of IWRM and the obligation to elaborate and implement integrated basin management plans. The structure of IWRM is fully specified and established by the subsequent regulations stemming out from the Water Law.

The Regulations also fully specify the steps toward preparation of programs of measures and basin management plans to reach the objectives, which must balance environmental and economic-society needs in a sustainable manner. The Regulations also distribute responsibilities among environmental protection institutions in IWRM. Lithuania has designated four river basin districts (RBD): Nemunas, Lielupe, Venta and Daugava. However, water management institutions in Lithuania have been established according to administrative borders and not according to river basins.

In addition, the Coordination boards have been established in 2005. They comprise the representatives from national and regional levels, from government and NGOs. The Boards will act as a platform of stakeholder involvement in decision making while preparing and implementing basin management plans. In this way Lithuania has set the structure for IWRM – for the preparation and implementation of basin management plans¹².

Political changes and privatization processes have caused much dispersed water supply and wastewater management system. Water supply and sewerage services in Soviet times used to be carried out by the State. In 1995, the municipalities became owners of the water supply and sewerage systems and became responsible for the supply of drinking water and the treatment of sewage, which is usually carried out by municipality-owned public companies. Beside them there are approximately 1.330 individual supplies of drinking water exceeding 10 m³/day or serving more than 50 persons. More than 1400 small and large wastewater treatment companies discharge their waters into surface streams of Lithuania. Due to dispersed water management system it is rather difficult to coordinate these activities. In spite of privatization all water services providers are still financed from the Lithuanian state budget.

Key stakeholders in water management

Three institutional levels of water management can be distinguished in Lithuania – national (state), regional and local (municipal). The state level comprises the Parliament, Government (Cabinet of Ministers) and ministries with subordinated institutions, including regional authorities.

¹¹ Source: *Towards effective management of water resources in Lithuania*. GWP-Lithuania, 2002.

¹² Source: *GWP Survey of National IWRM Policies, Strategies and Plans*, 2005.

National level

Ministry of Environment (MoE) is the main ministry responsible for water management in Lithuania. The main task is to ensure healthy and clean environment, rational use, protection and restoration of natural resources, its territorial waters, continental shelf and economic zone. These tasks are executed by the departments, services, inspections established under the Ministry and other institutions subordinated to the Ministry. The enforcement of environmental legislation and implementation of environmental policy at the regional level is the task of the eight (8) Regional Departments of Environmental Protection, situated in the administrative centers of Lithuania.

Environmental Protection Agency was created in 2003. Its River Basin Management and Pollution Prevention Department is directly responsible for practical implementation of the EU Water Framework Directive. The EPA also operates state cadastre of rivers, lakes and reservoirs.

At the national level, there are other ministries dealing with water issues:

- **The Ministry of Agriculture;** it is not directly involved in water management and water monitoring but can have a very important impact on the quality of water by managing agricultural practices, preventing pollution from diffuse sources and maintenance of drainage network (80% of agricultural lands are drained). This Ministry regulates the rates of fertiliser and pesticides application in agriculture and makes recommendations concerning environmentally friendly agricultural practices (A Code of Good Agricultural Practice was prepared in 2000). The Agricultural Advisory Service provides advice on good agricultural practice and reduction of diffused pollution from agricultural sources.
- **The Ministry of Health Care;** it has an important role with respect to human health and water. The Ministry is responsible for the sanitary control and elaboration of standards of all drinking water and of recreational water bodies (bathing water). Some functions regarding hygiene aspects are delegated to the Institute of Hygiene (regulations on bathing water, creation of monitoring programs). The State Hygiene Inspection carries out assessment of compliance with the drinking and bathing water standards.
- **The Ministry of Transport** is in charge of navigation, and has also a role on river management. Under this ministry supervision, there is the Directorate of Water Ways (state enterprise) responsible for the regulation and surveillance of the inland waterways.
- **The Ministry of Interior** is not directly involved in water management but the institution subordinated to the Ministry named The Civil Security Department is in charge for the prevention of extreme ecological situations and liquidation of accident's consequence. On the regional level Centers of Management of Extreme Situation there are established.

Other institutions involved in water issues are Marine Research Center (it is employed to research of the environment of the Baltic Sea and Curonian lagoon, including monitoring of surface waters and wastewater in western Lithuania), Hydrometeorological service (organizes, coordinates and carries out regular hydrometeorological, observations throughout the country), Protected Areas Department (management of protected areas), and Geological Survey (dealing with groundwater resources and groundwater protection).

Regional level

Counties represent the higher state administration in Lithuania. The Government appoints the governor of the County. The Counties among other functions implement State policy concerning physical planning, use and protection of land, and environmental protection. The Governor controls, among others, the management of water bodies, and of protection strips and protection zones around water bodies. At regional level 10 Counties share the responsibility of water management.

Regional Departments of Environmental Protection are the most important institutions at the regional level. The organisation of the Regional Departments is based on administrative borders. The RDs are subdivided into agencies (total number 52), which have offices in the municipalities and are responsible for environmental protection at the local level. With respect to water management their main tasks are:

- collection of information from the monitoring sites in rivers and point sources, including sampling and analysis of samples;
- delivery or renewal of licenses for water abstraction and the discharge of effluents;
- supervision of Environmental Protection Agencies (EPAs) placed under their authority;
- control of the accuracy of calculation of tax payment of legal and natural persons on environmental pollution and applying of sanctions defined in the laws;
- inspection of economic entities and natural persons if they comply with the requirements of environmental protection and use of natural resources;
- monitoring of use of allocations from environmental protection funds of local municipal authorities;
- cooperation with the public on implementation of environmental goals, information of the public about changes in the status of the environment, and taking part in environmental education activities.

The other regional offices, which are involved in water management, are:

- 3 Regional offices of the Hydrometeorological Service, which are responsible for the work of regional monitoring stations.
- Regional offices of State Public Health Centre (PHC) and the State Hygiene Inspection of the Ministry of Health Care and Service of Food and Veterinary of the Ministry of Agriculture.

Local level

Generally, municipalities are responsible for environmental management in their territory, including water management, implementation of relevant laws and regulations and cooperating with related state and regional authorities. The municipalities are owners of the water supply and sewerage systems and are responsible for the supply of drinking water and waste water treatment, which is usually carried out by municipality-owned public companies (Water supply and wastewater treatment companies). The municipalities are setting their own prices for water services.

Elections to the councils of the municipalities are organised every three years. The total number of municipalities in Lithuania is 60. The municipalities have set up the Association of Municipalities, a non-governmental organisation. The NGO represents the municipalities in Parliament, Government and in international organisations.

Currently, the municipalities participate in water management by being responsible for drinking water supply and the collection and treatment of sewage and discharge of sewage effluents, setting prices for drinking water supply, collection of sewage and by approving permits for the discharge of effluents to sewers.

The water service companies have formed the "Water Suppliers Association", a non-Governmental Organization. The Association coordinates the activities of the Water Services Companies and serves as a representative body at the national and international level.

Implementation of the Water Framework Directive

Nowadays the main concern is implementation of the Water Framework Directive and other EU water directives. Although the main EU water directives are already transposed into the national

legislation (Urban Waste Water Treatment, Dangerous Substances, Nitrates, Fish Water, Drinking Water, Bathing Water Directive, etc.), the implementation of the directives will still require a lot of effort at all management levels. Expansion of monitoring programs, development of quality assurance systems, design of long-term quality objectives waters, establishment of new administrative structures for permitting and data collection are to be mentioned. The WFD requirement to apply river basin principal in water resources management will lead to reorganization of administrative system and strengthening of co-operation in water management with the neighboring countries.

Part of Lithuania's obligations related to the implementation of the WFD is to conduct public consultations during the process of planning for the River Basin Districts and implementation of the plans. For this purpose awareness raising, education and training of society is still needed. Non-governmental organizations need to increase capacity, improve theoretical and practical skills and experience required for implementation of the River Basin Management and IWRM approach in practice.

Lessons learned

Since independence, water management has been a top priority in an environmental area. The importance of water sector was indicated in all environmental protection programmes developed during the last 15 years. But despite many efforts to improve water management, problems in water sector are still among the main environmental concerns in the country.

The administrative capacity is probably too low to absorb the EU investment flows and to supervise the project development effectively. Therefore strengthening administrative capacity of water sector is necessary.

It is obvious that too many institutions are involved in water management of Lithuania today. Water management structure is over-complicated and rather difficult to coordinate. Coordination of activities and actions of various stakeholders is the main task of the Ministry of Environment.

In spite of these obstacles Lithuania is making firm steps towards implementation of river basin management and IWRM principles. The structure of IWRM is fully specified and established by the regulations of the Water Law. National awareness raising campaigns started by the GWP-Lithuania in 2000 are continued by governmental and non-governmental organizations.

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4.5 Case study: Institutional development of river basin organizations to implement the Integrated Water Resources Management in Poland

History and evolution of water authorities and organizations

The first legal and organizational regulations concerning water resources management were introduced in Poland reborn after the 1st World War in 1919, upon the establishment of the Ministry of Public Works. The Ministry was, among others, responsible for all water management affairs in Poland. In 1922, the Water Law was established. It is, however, 1930 that can be considered as the beginning of water protection activities in Poland when the government established the Inter-Ministerial Commission for Protecting Rivers against Pollution.

In 1964, the District Directorates of Water Management (DDWMs) – in Polish “Okregowe Dyrekcje Gospodarki Wodnej” (ODGWs) – were established primarily to construct, supervise and operate water works. The Directorates were loosely fitted to river basin boundaries. The Voivodship Governments (provincial administration bodies representing the central national government) were responsible for rivers and streams that were not managed by the DDWMs. They were (and still are until today) responsible for the system of issuing water use and wastewater disposal permits across the entire country. Domestic water supply, sanitation and wastewater treatment were the responsibility of city authorities and local administration authorities (municipal and rural “gminy”).

In 1972 the situation has changed and all water-related matters regarding to environmental protection were subordinated to the Ministry of Administration, Country Planning and Environmental Protection. The quantitative water resources management was transferred to the Ministry of Agriculture. Until 1989, the responsibilities for water management were changing quite often being divided among different ministries. The institutional arrangements were often subject to rather incidental restructuring. In 1974 the Parliament passed the new Water Law, however as before, it was based on command and control management principles. Water management generally focused on hydraulic engineering and investment planning to support industrial and agricultural development. However, several innovative approaches were brought about, especially in the area of water pollution control, nature conservation (among others the concept of “minimum environmental flow” was introduced) and flood management.

Institutional reform: decisions and actions taken

In the beginning of the 1990s, after almost 50 years of heavily centralized water management, considerable effort was made to update the former approaches towards water management, taking into account the political, economic and social transformation of the country. The update covered above all: (a) basic water management objectives, (b) mechanisms and instruments of water resources management, with a special attention given to economic instruments, (c) water management challenges and constraints due to the fundamental change of the country’s development assumptions, relations among different sectors of the national economy, and new international obligations (working towards European integration).

In 1991, the Water Law was updated, among others authorising the Ministry of Environment, Natural Resources and Forestry to establish seven Regional Boards of Water Management (RBWMs) – in Polish “Regionalne Zarządy Gospodarki Wodnej” – operating in water regions defined by hydrographic instead of administrative boundaries. The new administrative structure was charged, among others, with development of programmes and plans for water resources management, especially for arresting pollution of water resources, protecting drinking water sources, and flood control.

The Ministry of Environment was established in 1999 and it operates until today. The Ministry is responsible for two sectors of national economy, namely environmental protection and water resources management. By 2001, the responsibilities of RBWMs were expanded by merging them with DDWMs (ODGWs).

The long awaited new Water Law – clearly oriented towards river basin management – was passed by the Parliament in 2001. The driving force was to transpose the EU water-related directives, among them the Water Framework Directive (WFD). The Water Law stipulates that water resources are managed in accordance with the principles of sustainable development following hydrographic boundaries of the Vistula and Odra (Oder) river basins. The need of integrated management of surface and groundwater taking into account their quantity and quality is underlined.

In July 2007 the Water Law was updated again, establishing the National Board of Management under the supervision of the Ministry of Environment. The National Board is a central body of state water management administration, charged with development of the national water policies and strategies, co-ordination of the RBWMs operations, and assistance of the interbasin actions, including boundary rivers and international basins.

It should be mentioned that rational utilization and protection of water resources (seen as part of environmental resources) are mentioned in the Polish Constitution (1997). It reads “The Republic of Poland shall guard the independence and the inviolability of its territory, secure the human and civil freedom and rights, the public safety, the national heritage and shall secure protection of the environment based on the principles of sustainable development”.

The Water Law defines responsibilities at different management levels. At the national and regional levels these institutions are assisted by the National Water Management Council and Regional Water Management Councils of the advisory character. These councils are attached to the national and regional boards of water management respectively. The water permits (licenses) for specific water use (water abstraction) and all type of engineering undertakings affecting the natural regime of surface- and groundwater are issued by the state administration units (starosta – county governor, wojewoda – provincial governor). These permits are issued on the basis of the river basin plans developed by the Regional Boards of Water Management.

Key stakeholders in water management

The institutions responsible for water resources management are the following:

- The Minister of Environment who is responsible for all aspects of water resources management in the country;
- The National Board of Water Management, under the supervision of the Ministry of Environment representing a central body of state water management administration;
- The Regional Boards of Water Management, as bodies of state administration operating in the specific area delineated by hydrographic boundaries (river basins);
- The Province Governors (Wojewodas) and their offices (Voivodships), as a regional representation of the state administration; and
- The territorial self-government authorities (Voivodship Marshall – Marszalek Wojewodztwa, County Chief – Starosta, Community Head – Wojt/Burmistrz).

The main responsibilities for the rational use, protection and management of water resources in Poland are vested in the Minister of Environment. Its most important tasks include:

- developing the state’s environmental and water policies, proposing parliamentary acts and legal regulations as well as economic instruments to promote the rational use and protection of water resources;
- inter-sectoral and inter-regional co-ordination of water resources management;
- solution of conflict situations arising because of water permits and licenses issued by wojewodas;
- issuing regulations needed for enforcement and implementation of parliamentary acts;
- establishing and supervising all subordinate units, in accordance with stipulations of the Water Law.

The responsibilities of the Chairman of the National Board of Water Management include above all co-ordination of the RBWMs operation providing also assistance in their inter-basin actions targeted at the rational use, preservation and protection of water resources.

The Regional Boards of Water Management (RBWMs) are responsible for management of water resources in each of the seven hydrographic areas of the country (Lower, Middle and Upper Vistula, Lower, Middle and Upper Odra and Silesia coal and heavy industry basin). In 2001 their responsibilities were expanded by combining them with the former District Directorates of Water Management (DDWMs). While RBWMs were earlier planning and management units only, the DDWMs were responsible for investment activities and operation and maintenance of the existing water infrastructure. In spite of a rather different character of former RBWMs and DDWMs, the existence of two separate “water agencies” operating over almost the same territory, was difficult to defend in the process of reducing the number of government agencies (including ministries) undertaken in the late 1990s.

The RBWMs (state regional (river basin) agencies) have following responsibilities:

- balance calculations of surface and groundwater resources;
- developing programmes and plans of water resources development and protection of their quality in particular river basins as well as planning flood control undertakings;
- developing the principles of water use for particular basins;
- management of information system on water resources and their use in the areas covered by given RBWM;
- co-ordination of different initiatives concerning water resources, including studies and investigations concerning the rational use of water resources;
- issuing water permits for inter-basin water transfers and for the construction of engineering works protecting against floods;
- maintenance and exploitation of surface water resources;
- participation in flood control activities during flood events;
- co-operation with the National Flood Committee and its provincial branches;
- initiation of studies and investigations concerning maintenance and exploitation of surface waters and expressing opinion of various projects affecting water management
- preparation of the annual and multi-annual investment and financial plans for repair, exploitation and the construction of new water infrastructure works;
- co-operation on the state boundary rivers;
- programming development and maintenance of inland navigation and tourist waterways, taking into account the requirements of environmental protection and flood control needs.

The Provincial (Voivodship) Boards of Land Improvement and Water Installations administer the state-owned waters that are not under the responsibility of RBWMs. In addition, the National Parks administer waters located in their territories and the State Forestry Enterprise administers waters situated within the forest zones under its jurisdiction.

The responsibilities of the Provincial (Voivodship) Boards of Land Improvement and Water Installations working under the guidance of the Provincial Departments of Agriculture (provincial agencies of the Ministry of Agriculture) are the following:

- maintenance and exploitation of the basic land reclamation infrastructure (irrigation and drainage);
- participation in the flood control activities during the event – the Boards are directly responsible for maintenance of the flood dikes;
- investor services for the investments totally or at least partially financed from the state budget, mostly land reclamation (irrigation and drainage, rural water supply and sanitation).

Important role in the current water management system is played by Vojevodas (Province Governors). The country is divided into 16 administrative provinces each headed by Vojevoda. Their duties are the following:

- issuing permits (licenses) for water abstraction, waste disposal, construction and operation of hydraulic structures;
- deciding on the level of resource fees for the use of water and for hydraulic structures;
- specifying the areas potentially endangered by flooding and introducing limitations in their use and development;
- specifying water intake protection zones.

The territorial agencies of the government administration operate as the so-called unified bodies, what means that responsibilities for all decisions at this level are vested personally in Vojevoda. Directors of the Voivodship Departments act only within the limits of authorisation granted them by Vojevoda. The same applies to the directors of Environmental Departments that exist in all 16 vojevodships.

The supervision over compliance with the regulations and environmental monitoring is carried out by the Chief Inspector of Environmental Protection. At the voivodship level, the tasks of environmental inspection are performed by Vojevodas through the Provincial Inspectors of Environmental Protection. The Provincial Inspector deals with the proceedings brought up against any polluter that is hazardous to human health or life and/or causes any other damage. He decides on the level of fines for any misuse of the environment and for exceeding the limit pollution values as specified in administrative decisions (licenses).

Implementation of the Water Framework Directive

In accordance with the WFD timetable, by the end of 2004, Poland completed implementation of the first component of the planning process "Assessment of current status and preliminary gap analysis".

The WFD and its time schedule have considerable impact on the organization of work on the river basin management plans. The WFD principle is that instead of waiting until new data are collected, the planning process must go ahead. But whenever new data become available, they must be used for verification of the decisions and conclusions made earlier based on the data available at that time. Such a process calls for very careful organization of the planning work. It requires that institutional responsibility for each element of the planning process must be clearly established.

In Poland, like in all other EU members states, the national development plans for years 2007-2013 have been completed by the end of 2006 (including negotiations with the EU), however following the WFD schedule, the RBMPs shall be ready in 2009 only. At that time the programmes of measures to attain a "good water status" by 2015 will be finalized and the necessary funds for their implementation must be reserved earlier. This is just an example how important is coordination of work on RBMPs with other planning efforts being carried on in the country.

Overall, the impact of WFD implementation in Poland is positive, although the process is not an easy one. The international cooperation is very intensive, several new studies are being initiated, but it is clear that the WFD planning process calls often for more data and information than available. The human and financial requirements of the WFD implementation process are also higher than originally thought.

Lessons learnt

Efficient water governance cannot be achieved by governmental or intergovernmental activity alone. It requires co-operation and partnership between government and civil society, including NGOs (professional associations, ecological groups, educational bodies, religious organisations, etc.), which represent the broad diversity of interests in any given society. The NGOs are a political constituency to which politicians in democratic systems increasingly must respond. Equally key is the network of links between civil society and economic system prevailing in a given country.

The Polish experience so far allows identifying five principal barriers that make implementation of IWRM difficult:

- (1) human awareness barrier – this is not only the question of awareness of the average citizen; the situation is complicated with the decision-makers as well. Still some of them favour “nature harnessing” by technical means instead of giving priority to the right balance between the nature conservation and real needs of humans. Implementation of the “NATURA 2000” programme is a good example in this context;
- (2) education barrier – the society at large, including some decision-makers, has still rather limited knowledge of the new philosophy of water resources management, principles of IWRM, and the resulting water management rules. Their knowledge is sufficient for developing the “organizational schemes” but this is not enough for the design of modern water resources governance systems (coping with uncertainty, adaptive management, etc.);
- (3) organizational barrier – just to provide few Polish examples, decisions about water resources allocation (water abstraction licenses) are issued by state administration agencies that do not operate according to river basin boundaries, control of several water-related decisions is exercised by the Environmental Protection Inspectorate – another state administration (not a river basin agency), the RBWMs are not responsible neither for the quality nor for the groundwater resources;
- (4) financial barrier – capital outlays from the state budget for water resources management are insufficient. There is not enough money for maintenance and repair of the existing water infrastructure. Still several new projects are initiated without adequate long-term funding and consequently duration of construction activities is often extended much beyond the original plans;
- (5) political barrier- water resources management occupies relatively low position on the priority lists of politicians. Only the sudden flood or drought reminds all concerned and the public at large that this is an important sector of national economy and human losses as well as economic risks are extremely high.

To summarize, it must also be recognized that the flow of many other commodities than water, including money, follow rather administrative than hydrographic boundaries. The river basin is a fundamental spatial unit for water resources management beyond any doubt. But ...one has to remember that many critical for water management political, social and economic decisions are being taken by individuals and organizations which do not operate with the river basin on mind. Establishment of real cooperation between the water administration and “non-water” authorities must be given much more attention than it was given in the past.

This case study was developed by Prof. Janusz Kindler (e-mail: Janusz.Kindler@is.pw.edu.pl) in contact with several members of the Global Water Partnership – Poland, but all findings, interpretations and conclusions are the author’s own and should not be attributed to any other individual or organization.

4.6 Case study: Institutional development of river basin organizations to implement the Water Framework Directive in Slovakia

History and evolution of water authorities and organizations

Same as the long history of the water law in Slovakia, the institutional arrangements and system of decision making over water use, water discharges, and measures against floods and drought occasions are in place over more than 40 years.

The institutional arrangements of the state water administration undertook several changes of different consequences. In 1955, the Act on Water Management was adopted in the Czechoslovak Socialist Republic and it reflected political and economic situation of socialist political system, that traditional water rights were adapted to public property rights. Also the Act established a rule of central state distribution of waters. According to the Water Act of 1955, the state water administration was divided among national councils at local level and the Administration of the Water Management in Slovakia and the Ministry of Energy in Prague (central level). The Water Act from 1973 transferred the competencies into national level, namely the Slovak Ministry of Forestry and Water Management. At the local level, there were municipal, district and regional councils (narodne vybory). This system created the hierarchy and sub-ordination in decision-making process from top to down. The Ministry of Interior ensured the coordination function of between the Government and lower level authorities. The management relationships were further complicated due to the fact that the principle of horizontal supervision through representatives of district and regional councils were implemented. Drawbacks of this institutional arrangement involved the fact that the councils were also responsible to ensure and provide several economic activities as they carried out the overall responsibility for economic and social development at their jurisdiction. Thus, priority economic interests over-ridden other (for example environmental protection) priorities.

The accumulation of economic activities and decisions in water sector were obvious also at the level of the Ministry of Forestry and Water Management. This Ministry supervised and budgeted water operators, and in parallel, it managed enterprises of forest and wood processing industry (that means water polluters). In practice, peculiar situations happened, such as that the investor of water management facility (again the Ministry of Forestry and Water Management) was at the same time the water authority that issued the statements, approvals and permits with respect to water protection, and issued the permits for the construction and operation. Although the appeal procedures were in place, there were often curious situations that the same authority was the violator and appeal body.

The main problem of the Water Act was very weak implementation and enforcement. Thus, for example meeting provisions (such as waste water discharge limits) did not play an important role. Also, water master plans were not legally binding and served only as a guide for water managers. The Water Act was valid (with small changes in 1993 and 1995) till May 2002. Following experience might be concluded with respect to the assessment of the water governance aspects:

- Inconsistent system of the state water administration where the central body of the water management only indirectly coordinated activities of lower level bodies (other issues, such as staffing, training, equipment was managed by other central body)
- Conjunction of political and enforcement power at all levels of councils that resulted in false decisions with respect to water exploitation, rational water use and environmental protection
- Fusion of economic and environmental decisions that resulted in the conflict of interests and usually prioritization of economic interests.

Institutional reform: decisions and actions taken

Fundamental changes rose in 1990, when the Slovak Committee for the Environmental Protection was established (the Act 96/1990). It functioned as the central authority for the environmental protection including the protection of the water quality, water quantity and sustainable use of waters. The Ministry of Forestry and Water Management was still responsible for the economic activities related to water industry, such as management of river basins, water works utilities (supply of drinking water and sewage systems), water infrastructure development, flood and draught protection, hydro-meliorations and hydropower generation. The establishment of the Slovak Committee for the Environmental Protection led to the division of enforcement of regulation and provision for economic activities in the water management and allowed to divide the implementation of state water administration and water industry activities in the social and political system of newly democratic country in transition. The establishment of the special state environmental administration – environmental authorities (by the Act 595/1990 on the State Environmental Administration) as decision making bodies for the environmental issues including the water issues, was very important step. By this Act, district and regional environmental offices were founded and were directly supervised, trained and budgeted by the Slovak Committee for the Environment. So called “specialized” state environmental administration was the significant step towards integrated environmental management. Based upon the Act 595/1990, there were 7 regional and 41 district environmental offices. The borders of environmental offices coped with the hydrological borders of river basins that ensured that decisions made at the environmental office would take into account hydrological conditions in region in the question. The Slovak Committee for Environmental Protection was renamed in 1992 to the Ministry of Environment. The Ministry of Forestry and Water Management was cancelled and the competencies in the area of forest and water management were transferred to the Ministry of Soil Management (that includes the agriculture industry, food processing industry) and competencies in the area of wood processing industry came to the Ministry of Economy.

The system was active only till July 1996, when based upon the Act 222/1996 on Organization of State Administration, specialized environmental offices were cancelled and staff was incorporated into the general public administration. Thus, the agenda of environmental authorities was taken over into new 8 regional and 79 district offices. These offices belonged to the Ministry of Interior and the expert supervision was conducted indirectly through the Ministry of Environment. The jurisdiction of regional and district offices copied the administrative borders regardless on hydrological conditions of the area.

Based on political decision all responsibilities in field of the water management have been given to the Ministry of Environment including supervision of all river basin organizations (Slovak Water Management Enterprise) and the Water Research Institute.

Driving forces of reforming water decision making authorities were mainly to reduce financial costs of governmental apparatus rather than to address water protection and water management in integrated way. Contrary, the river basin organizations were not reformed, although having basin scope of functioning might have excellent preconditions to act in line with both EU WFD and IWRM principles.

Key stakeholders in water management

Following governmental institutions are in place in Slovakia:

- River basin organizations – Slovak Water Management Enterprise (SWME) funded by the Government. The SWME is divided into four operation units based upon the basins and is res-

possible for the operation and maintenance of watercourses, assuring all their functions, and manage watercourses and water engineering structures. SWMEs are responsible (as state-owned companies) to undertake development, maintenance and operation of waterways, development of conditions for exploitation of watercourses and reservoirs for shipping and their exploitation in the national economy as well as for flood protection.

- Regulatory and enforcement agencies – Regional Environmental Offices (REOs) have been designated as competent authorities for the implementation of the WFD within the river basin district lying within their territory. However, the REOs cope with administrative rather than basin borders. The REOs provide coordination of fulfilling tasks resulting from river basin management plans and programmes of measures targeting to achieve environmental objectives.
- Water services providers – water utilities serving water supply and waste water disposal from urban areas. Originally, the water utilities were state established centralized entities. In 1997, the Government decided on the decentralization of water works utilities and a transfer of assets to municipal level. Unfortunately, the process was politically hampered and several times postponed. The final decision on the decentralization was taken in 2003. Currently, they are both municipal or private companies, or combination of public – private arrangements.

There are also supporting institutions that contribute to the decision making process, namely the Slovak Hydrometeorological Institute (SHMI) and the Water Research Institute (WRI). The SHMI is directed by the Ministry of Environment and the main objective is to obtain process, interpret and store the data on the state and regime of water. The SHMI develops its activities in three areas: hydrology, metrology and climatology, and in the area of monitoring of air quality. The WRI conducts research projects and prepares the expert base the development of water infrastructure and other water economic activities. In 1998, the National Reference Laboratory was established at the WRI.

Another supporting institution dealing with the environmental issues is the Slovak Environmental Agency (SEA) that operates the Information and Monitoring System of the Environment. The issues of the quality of drinking water are dealt with at the Institute of Public Health and the Research Institute of Soil Fertility and Protection (RISFP) conduct the research on protection of waters against agricultural pollution.

To conclude the list of main stakeholders in water management, it is necessary to point out that there are also Slovak Water Inspectorates. They existed in all above mentioned systems of the institutional arrangements. The Slovak Water Inspectorates were established in 1976. They perform the state professional supervision and is directed by the Ministry of Environment. The inspection imposes penalties in the cases of violation of environmental (and water) legislation including the proposal of remedial measures. They are determined according to the areas of river basins. They conduct special tasks with respect to international commitments, such as the warning and alarm system of transboundary rivers. The organizational setting was not changed from its beginning and the inspectorates are placed in 5 cities with the centre is in the capital Bratislava.

Implementation of the Water Framework Directive

The Slovak Ministry of the Environment as Competent Authority for implementation the WFD methodically regulates regional environment authorities in the field of fulfilling the tasks resulting from river basin management plans and programmes of measures targeting to achieve environmental objectives.

The expert organization of the Ministry of Environment – the WRI – is in charge to develop methodological guidelines regarding the implementation of the WFD. There is quite difficult situation due

to the fact that, according to the Slovak Water Act, the responsibilities for management of river basins (including the River Basins Plans and Programmes of Measures) are under the competence of river basin organizations (Slovak Water Management Enterprise).

In spite of the fact that all key stakeholders are under the supervision of the Ministry of Environment, there is not a transparent allocation of mandates and powers regarding to river basin planning. In addition, other stakeholders and the public has limited both information and options to be actively involved in water planning.

Slovak water policy has indeed embraced and moved toward IWRM, but the decentralization has spread water management responsibilities and authority across a large number of entities. Some of them are designated according basins, while other according administrative borders. Organization responsibilities and relationships appear to be substantially less integrated than policy. Currently, there is a substantial gap between the basin – scale organizations and the activities that comprise IWRM, most of which have been assigned to sub-basin agencies.

Lessons learned

The provision of the Slovak water legislation have set up arrangements regarding development of the River Basin Management Plans and integrated approach in this field. On the other hand there are some weaknesses which could lead to problems due to insufficient definition of responsibilities of all “players”.

An important role to integrate urban (and other sectoral) development with water resources management was delegated to regional environmental authorities, that suppose to coordinate implementation of river basin management plans. However, these authorities are understaffed, do not pose a broad expertise and lack financial support from the Ministry of Environment. Many expectations to perform the implementation of WFD are given to specialized institutions, such as the WRI and the SHMI. From point of view of integrated approach there is not ensured cooperation with other relevant sectors as agriculture, economy, transportation and others.

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4.7 Case Study: Azerbaijan: Institutional Development of Water Management Organizations

History and evolution of water authorities and organizations

Azerbaijan, located in the estuary of the river basin of the Kura and Araz rivers, has a very long history of water management. Azerbaijan is a land of ancient irrigated agriculture. Archaeological studies show that the irrigation system in Azerbaijan was identical to the ancient water installations of Egypt, India, and China. There are traces of major irrigation canal built back in IV-VI centuries found in the Meel steppe. Traces of ancient irrigation are also found in large numbers in Muga, where tracks of many irrigation canals are clearly visible.

Water management is the critical sector in country’s economy and closely related to the other sectors. It is indispensable in the social and household needs to the Azeri population. Water resources in Azerbaijan are government-owned.

Prior to the political transformations four primary institutions were responsible for water resources management in Azerbaijan, with an additional ministry serving in a quality control capacity:

- Ministry of Amelioration (responsible for irrigation, water supply and sewage services in medium and small settlements)
- Ministry of Energy (hydropower)
- Ministry of Communal Services (urban water supply in medium and large settlements)
- Ministry of Geology (ground water resources and facilities)
- Ministry of Health (monitoring of potable water quality and approval of latrine locations).

Three ministries shared the management of surface water resources management and one oversaw groundwater resources, though irrigation and hydropower factors apparently dominated the water sector. For example, integrated water resources management plans were prepared for the Kura and Araks River Basins in the 1970s, but were never implemented.

After the collapse of the U.S.S.R. national land improvement and water management system has been transformed. First, the Committee for Land Improvement and Irrigation under the Cabinet of Ministers of the Republic of Azerbaijan was established in 1993 (until then there the Ministry of Land Improvement and Water Resources of Azerbaijan), replaced by the State Agency for Land Improvement and Water Resources under the Ministry of Agriculture in 2004.

The evolution of the water sector has not been conducted in a single step; rather, the transition of the past 15 years has included abolishment of prior organizations and numerous interim restructurings, which reflect the search for organizational solutions appropriate to the unique situation in Azerbaijan.

In 2006 Open Joint-Stock Company (OJSC) of Land Improvement and Water Resources was set up with responsibilities for utilization and management of water resources, operation of irrigation and drainage systems, conducting anti-avalanche and anti-flood activities in the country.

Various organizations exercised control over utilization and protection of natural resources. State Committee for Environment and Control over Utilization of Natural Resources maintained government control over utilization of natural resources.

Azerles manufacturing association was responsible for forest resources, Committee for Geology and Mineral Resources for underground resources, Azerryba State Corporation was responsible for fisheries, while the State Committee for Hydrometeorology offered hydrometeorology services, observation, and prepared forecasts.

In the framework of structural reforms, the environmental organizations duplicating each other such as State Committee of Environment and Control over Utilization of Natural Resources, Azerles Manufacturing Association, Committee of Geology and Mineral Resources, Azerryba State Concern and State Committee of Hydrometeorology have been eliminated and the Ministry of Environment and Natural Resources was set up to replace them (Decree No. 485/2001).

Absheron Regional Joint-stock company provided drinking water to the cities of Baku and Sumgait and northern districts in the country. In 2004 Azersu joint-stock company was established to improve water management.

All Schemes including general and other schemes for comprehensive utilization and protection of water resources, scheme for comprehensive protection of environment, scheme for development and placement of public utilities and water management and land improvement construction schemes have been developed in the Soviet times in different years (the last ones in the 1990s).

These schemes were mainly developed in the period up to 2010 as the constituent element of the former standardized Soviet scheme. However, there are grounds for comprehensive approach for utilization and protection of water resources. Major shortcomings of these schemes is that they do not fully reflect sustainable, fair, and reasonable water supply for the needs of water users and nature as well as water resources balance across natural and economic zones.

Concurrently water charges have been introduced in Azerbaijan starting 1997 based on the Statute on Rules of Water Charges in Azerbaijan Republic. An institutional mechanism and conditions for water users in the distribution of irrigation water quotas have been introduced for rational and efficient use of water resources.

Establishment of WUAs started in 1996, initially with World Bank support, and 580 Water Users' Associations have been already formed by the water users themselves, covering 60% of irrigated areas. World Bank's Irrigation-2 Project envisages turning over of intra-collective farm irrigation and drainage systems to the water users associations as non-profit organizations for long-term use and management. In order to enhance the legal framework and better performance of WUAs, amendments were introduced to the Law on Land Improvement and Irrigation of the Republic of Azerbaijan in 2004. According to the law, WUA was renamed into Water Users' Unions (WUU). Central and local support groups for WUU have been established by Land Improvement and Water Resources OJSC and locally.

Current Situation

Official Status of Competent Agencies

Water is supplied to the industries and residents through existing hydro-technical installations, which enable to redistribute surface flow from one territory into another and by seasons of the year.

Water resources in Azerbaijan are managed according to the existing legislation. The laws adopted by the Parliament are implemented through respective Presidential decrees. These decrees also identify the powers of respective government institutions.

Based on the Presidential decree, the Cabinet of Ministers adopts a number of resolutions and decisions prepared by the competent executive bodies.

Currently major advanced water management complex is operating in Azerbaijan, which includes water reservoirs, waterworks, primary canals and collectors, inter-collective farm canals, pumping stations, sub-artesian wells, and other facilities. Azerbaijan's Land Improvement and Water Resources OJSC has the responsibility for management, operations, and technical maintenance of these water facilities. It is the major body responsible for management, utilization, and protection of water resources, maintenance of irrigation and drainage systems as well as anti-torrential and anti-flooding measures. There are more than 100 regional maintenance departments and other structural units under the Joint-Stock Company.

Ministry of Environment and Natural Resources implements government's environmental policies, arranges for control over the use of natural resources, rational utilization of underground waters, mineral resources, and surface natural resources, and their rehabilitation, observation, and projections, and setting-up hydrometeorological service. It undertakes quantitative and qualitative monitoring of protection of surface waters from pollution, and has the responsibility for utilization and protection of underground waters.

The Ministry of Ecology and Natural Resources (MENR) was established in 2001 to replace the former State Committee for the Environment, with an expanded mandate that includes geology, fisheries, and forests. MENR has a central apparatus, 21 specialized departments (including, among others, Caspian Environmental Monitoring, Department of Fishing Reproduction, Department of Forestry, Hydromet, State Environmental Inspection, and others); 5 subordinated research oriented agencies, 29 regional environment and natural resource departments, 41 enterprises for forest protection and regeneration, 10 fish hatcheries, and 7 geological expeditions (essentially, prospecting and inventory teams).

Overall, Ministry of Health is responsible for the quality of drinking water. Azersu OJSC is responsible for supplying drinking water to the domestic population and distribution. Ministry of Industry and Energy is responsible for hydro- energy policies and programs. Integrated management of the water resources in the water reservoirs on the Kura river (Mingechaur, Shamkir, and Enikend water reservoirs) and Araz (Araz water reservoir) river for irrigation, energy, and fishing purposes are annually regulated by the Land Improvement and Water Resources OJSC and AzerEnergO OJSC.

Ministry of Agriculture coordinates activities to improve land yield, control over fertilizer use, improve water supply to agricultural farms and irrigated lands, and awareness raising efforts for farmers.

Lessons learnt

After the political transitions of the 1990s, the Azerbaijan water sector was propelled into an involuntary and uncertain transition. Almost two decades later, two created organizations (Azersu JSC and Birlishmish Sukanal) hold key water supply and sanitation responsibilities; yet tasks and functions appear to be unclear at the operational (Rayon – utility) level.

The political decentralization that, in 1999, resulted in the creation of about 2,500 rural municipalities and about 200 town municipalities has not reached very deep. In practice, the balance between the local organs of the executive and elected local powers remains heavily skewed in favor of the former, despite formal allocation of many powers to elected local governments. This situation applies also to environmental management, where environment and natural resource departments and forestry enterprises subordinated to MENR make all important decisions and control funds.

Repeated reforms at the national, ministerial, operational and community levels – often times lacking clear sector-wide coordination or in reversal of prior changes – have resulted in some blurring of jurisdictions, overlapping (or neglecting) of mandates and uncertain hierarchies (for example, when committees become ministries and vice-versa). At the operational level, this can lead to failure (if mandates are undefined) or inefficiency (if mandates overlap) to execute particular duties.

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4.8 Case study: The Kyrgyz Republic: Reforming National Water Institutions

History and evolution of water authorities and organizations

According to the archaeological data, the genesis of irrigation within the borders of Kyrgyzstan dates back to the beginning of this era. It is appropriate to mention some historical data here: the

first canal mentioned in the history of Kyrgyzstan – Uzgen-Aryk in the basin of Karadarya river exists even now; water used to be supplied to Nevaket city (Krasnorechensk) through main canal currently known as Maltabar-Aryk; individual home basins (hauzs) and water-lifting structures – chigiriq as well as one-time irrigation during flooding where widely used.

Notably certain irrigation facilities were built in the tsarist times, as the construction continued even during World War I. But waterworks management and operation, construction of irrigation systems and land improvement works have reached significant scale and turned into a sector of the economy in the Soviet times.

National water management institutions were established in the times when Central Asia was split into nation-states. The Water Resources Department of the Kyrgyz Autonomous oblast was set up in 1925. Then Water Resources Department of the Kyrgyz Autonomous Soviet Socialist Republic (ASSR) was merged with People's Commissariat of Agriculture forming Central Irrigation Department headed by a deputy narcom (people's commissar) in 1931.

Most significant structural transformation in the history of water management was the establishment of People's Commissariat of Water Resources in 1940. The Ministry of Water Resources of the Kyrgyz SSR was merged with the Ministry of Agriculture in 1953 but an independent Ministry of Water Resources was reinstated in 1954.

Increasing capital investments into the construction of water management installations and development of irrigated agriculture has led to emergence of two institutions – Ministry of Land Improvement and Water Resources and Main Department for Irrigation and Sovkhoz (state-owned farm) Construction.

Management of the utilization of water resources of Kyrgyzstan jointly by the neighboring countries has been practiced since mid-1920s up to 1932 by Eastern Ferghana, West Ferghana, and Chu-Talas parity commissions under the Central Asian organizations. Then, after abolition of the commissions international systemic departments on Aravan-say and Ak-Buura, Isfara, and Tala-su rivers were created. Parity commission of the Chu system has been preserved. As for other international systems – Kara-Unkuyur, Mayli-Suu, Padisha-Ata, Sokh, Isfayram-Say, Shakhimardan, etc. all doubtful issues were resolved in special meetings.

Due to dismantling of the Central Asian management bodies, water administration system in Kyrgyzstan was reorganized in 1935. For instance, Aravan-Ak-Buura international systemic irrigation department united three districts in Kyrgyzstan (Nookat, Aravan, and Osh) and three districts of Uzbekistan (Markhamat, Jalalquduq and Khojaabad). Talas international systemic irrigation department regulated water utilization in the Talas and Kirov districts of the Kyrgyz ASSR and those districts of the Kazakh SSR feeding from the Talas river basin. There were Isfara international systemic department and Chu parity commission, too.

These systemic departments were financed by the stakeholder republic proportionately to the acreage of irrigated lands.

Because the water rights of the republics were not clearly defined in the aforementioned systems and water utilization was based on the acreage of cultivated land increasing every year disregarding the capacity of the system, this procedure had always created disputes among the specialists. It was essential to radically review and improve the management structure and system.

According to the order to the U.S.S.R People's Commissariat of Agriculture issued on December 1, 1936, the People's Commissar of Agriculture of the Kyrgyz Republic was permitted to set up the following inter-district systemic irrigation departments:

- Issyk-Kul department situated in Karakol town for catering to the six districts in the valley;
- Tian-Shian department in Naryn city for six districts;
- Chu International System located in the Lebedinovka village of Kand district for serving six districts in the Kyrgyz SSR and two districts in the Kazakh SSR;
- Jalal-Abad department in Jalal-Abad city for supplying to seven districts;
- Twelve districts of the Kyrgyz SSR and three districts of the Uzbek SSR were subordinated to the Aravan-Buuri international department.

Major resolutions of the Central Executive Committee and Council of People's Commissars of Kyrgyzstan on the procedures of water distribution and utilization in the irrigation systems, responsibility for violating water utilization plan, theft, and irrational use of irrigation water preceded the structural transformation.

Subsequently, starting the 1960s agency interests and hindrances had started to prevail and water management institutions were reorganized based on administrative subordination principle and territorial division of the country. It is notable though the bodies authorized to control utilization of water resources and issuing permits to use water were based primarily on hydrographic principles. In 1988 Main Department for Integrated Utilization of Water Resources was instituted within the Ministry of Water Resources in Kyrgyzstan, which performed its functions through basin water management bodies but this reform was not adequately effective and the subsequent reorganization was cut short by the independence process underway.

The Kyrgyz Republic, like other Central Asian countries, is in transition toward a market economy. With the transition from administratively centralized and river-basin-oriented water resources management in the Soviet Union to management by five independent Central Asian republics, the vast and complex irrigation system of the region has become fragmented. The management of water is now organized along administrative boundaries of provinces and districts, ignoring hydrological principles. In addition, the Kyrgyz economy is undergoing agrarian reforms of property relations in the agriculture sector. The former Sovkhoz and Kolkhoz (FSKs), the state and collective farms, respectively, are being transferred to private ownership and/or lease rights.

According to the Decree on Reorganization of Central Executive Bodies of the President of the Kyrgyz Republic issued in 1996, two ministries – the Ministry of Water Resources, and the Ministry of Agriculture and Food Industry were unified forming the Ministry of Agriculture and Water Resources. The Department of Water Resources was instituted to replace former Ministry of Water Resources.

Current Situation

Currently the sector-based management principle is in place in the Kyrgyz Republic, whereas the functions and responsibilities in water relations are distributed among various ministries and agencies. Water relations are regulated by the national parliament – Jokorgu Kenesh, the Government of the Kyrgyz Republic, Ministry of Agriculture, Water Management, and Processing Industry; Ministry of Emergencies; State Environmental Agency; State Agency for Geology and Mineral Resources; Ministry of Health. Furthermore, other bodies including Power Stations Joint-stock Company, town and

district center public utility companies, district local administrations and other bodies are involved in the management of water resources. Republican institutions are also involved in the regulation of water relations: National Statistical Committee; State Inspection for Standardization and Metrology; Ministry of Foreign Affairs; Ministry of Justice.

For the Kyrgyz Republic with limited oil, coal and other mineral reserves, water is a strategically important natural resource for sustainable socioeconomic development.

In the meantime, analysis of the trends in 1992-2006 demonstrates that tremendous water potential of Kyrgyzstan is used as inefficiently as ever, while regionally it not only brings no tangible economic benefits for the country but often is the source of tension in interstate relations.

Clearly, most of the aforementioned shortcomings are subjective in nature and caused by inconsistency of previous institutional reforms. Inter alia, often reform measures were limited to mechanical merger of management bodies, staff downsizing or pro-forma adoption of international management models adequate for the Western Europe but disregarding the traditions and nature of water relations in Central Asia including Kyrgyzstan.

Given these circumstances, new legal framework for reforming water management system has been developed and secured all approvals thanks to the joint efforts of the leading Kyrgyz and international experts. It has been reflected in the Water Code of the Kyrgyz Republic.

The list of primary measures envisaged in the Water Code include:

1. Establishment of an independent national body – State Water Administration (delegating the responsibilities of SWA to the Department of Water Resources is a temporary measure and this issue needs to be addressed in a decisive manner). This action will enable to:

- Remove duplicated functions and powers in the area of water resources management earlier delegated to a number of ministries and agencies;
- End agency-subordination of the management body designed to handle nationwide responsibilities;
- Promote integrated strategic planning, organization, and oversight of the range of mutually related activities for regulating water relations, current state and utilization of water resources;
- Specify the responsibilities of the basic management body for effectively performing its functions.

2. Establishment of National and Basin Water Councils – This action implemented in the context of ideology of integrated management of natural resources will enable to:

- Promote effective coordination of interactions of all stakeholders and water users;
- Address any forms of agency-based monopoly and corruption by means of collective and transparent procedures of making strategic management decisions;
- Improve the timeliness of management decisions;
- Limit government expenditures for maintenance of management bodies, as the activities of National and Basin Council staff should be unpaid.

3. Establishment of National, Basin, and District Commissions for irrigation and drainage

– Kyrgyzstan's irrigated agricultural sector, being the primary source of national food security and main consumer of water resources (almost 90% in the composition of national water use) may develop only with sustainable functioning of irrigation and drainage infrastructure. Existing trends of technical degradation of these systems and inefficient management, especially of on-farm networks privatized by independent water users require immediate and adequate actions to be taken.

In this regard, establishment of the irrigation and drainage commission system under the aegis of the State Water Administration will enable to:

- Consolidate efforts of national and local management bodies, water users from the irrigated agricultural sector, businesses and local communities focused on rehabilitation and further development of irrigation and drainage systems.
- Ensure practical implementation of the principles of decentralization and democratization of irrigation and drainage systems management by gradually transferring functions and responsibilities to the grassroots level;
- Gradually reduce the burden on government budget through expanding the involvement of local budgets, water users' association, etc., independent businesses in maintenance and development of this infrastructure.

4. Establishment of Dam Safety Commission – Majority of water management installations (irrigation, hydro-energy, etc.) in Kyrgyzstan have been in use for a long time with no significant rehabilitation after 1991 and on the verge of physical depreciation. Technical state of these strategic facilities – high pressure water reservoirs, major waterworks, etc. are causing particular concern, where breakdowns due to natural or manmade reasons may lead to catastrophic cross-border socioeconomic and environmental implications. The probability of emergencies is constantly growing and is the cause of concern for neighboring nations, primarily for Kazakhstan and Uzbekistan but this problem had not been given adequate attention until recently.

In this regard, establishment of Interagency Commission for Dam Safety as an independent body under the National Water Council will enable to:

- Ensure essential security of strategic water infrastructure facilities through systematic monitoring of their condition and taking adequate measures;
- Consolidate the efforts and resources of national and local management bodies, operation and maintenance companies as well as water users focused on rehabilitation, renovation, and ensuring safety of dams and other water installations according to the list.

5. Enhancing Government Oversight of the Current State and Utilization of Water Resources – Due to the previous inconsistencies in the institutional and market reforms, the system of government control and oversight of the current state and utilization of natural and other factors has significantly deteriorated. As a result, violations of water legislation, its norms and rules have become systematic. For instance, the cases of unauthorized and excess water use, takeover of land in the water fund, pollution of surface and underground waters, damage and theft of water facilities, violation of water user rights have become more frequent. Due to the inadequate financial, technical, and organizational support, water monitoring programs, national statistical reporting and inspection activities, there is no objective information base for making routine management decisions. Lack of effective mechanisms for prevention of water legislation violations and damage compensation based on the “polluter pays” principle of international law reduces the national and local government revenues and what is equally important, it does not provide adequate incentives to the people, water users, and businesses for rational utilization and protection of water resources.

Primary measures to overcome these problems should be:

- Establishment of State Water Inspection as an independent oversight body acting within the framework of policies designed by the State Water Administration of Kyrgyzstan and accountable to the National Water Council;
- Enhancement of organizational, human resources, and technical capacity of monitoring of the current state and utilization of water resources.

Implementation of these measures will enable to:

- Form an integrated database of the current state and utilization of water resources for effective planning and implementation of state water policies;
- Promote prevention and remediation of negative consequences of water and environmental offences, norms and regulations of water use;
- Promote additional investments for rational utilization and protection of water resources.

6. Enhancement of Economic Potential of Water Relations, Water Management and Protection

Activities. Lingering negative trends of deteriorating water infrastructure in Kyrgyzstan, inefficient technologies in the majority of water-consuming sectors of the economy and clearly inadequate measures for protection of water resources in many respects are due to the deficit of investments allocated for rehabilitation and maintenance of technical infrastructure and development of water relations in the country. Along with the objective reasons caused by limited capacity of national and local budgets, ineffectiveness of the previous actions related to external appropriations and donor assistance, greater investments to the water management sector by the local business community and development of procedures to transfer main economic responsibility for maintenance of water management systems and installations on the owners themselves should be acknowledged. In this regard, the priorities should be:

- Streamlining ownership rights for the water management installations, primarily accelerated privatization of non-strategic facilities by associations and independent water users;
- Streamlined market-based water utilization mechanisms based on unified contractual system of payments for water supply, drainage, and other water management services;
- Improving price and tariff policies for water utilization, enabling optimal reduction of burden on national and local budgets concurrently reflecting the trends in disposable incomes of households and miscellaneous categories of water users for water delivery services as well as in recording real costs of these services;
- Development and implementation of an effective mechanism of economic incentives for the activities focused on implementation of water efficient technologies and water protection;
- Nurturing favorable investment climate in Kyrgyzstan enabling to promote additional foreign investments and donor assistance for development of water management and water protection activities.

The UCC-Water (UNDP) supported Project was one of the first steps in implementation of IWRM principles nationwide with the assistance of GWP, and as a result, Road Map of transition to IWRM has been developed. Currently implementation of the project for development of a specific National IWRM plan similar to the one to be completed in Kazakhstan is expected.

Kyrgyzstan has accumulated tremendous experience in promoting the involvement of water users in the process of water resources management through WUAs established and supported by the government. The outcomes of their establishment were summarized in the Republican conference on WUA affairs held in early 2007 and objectives and steps in establishment of WUA federations and unions have been identified.

Stakeholder involvement in the process of interstate water management is being pilot-tested in the Joint bilateral Kyrgyz and Kazakh commission for Chu and Talas rivers and performance of its Executive Commission. The experience of commission's performance will be replicated on other international rivers in the country.

Another example of early stakeholder involvement is the project underway in Kazakhstan. The Kyrgyz representatives are participating in the development of Integrated Management Plan in Ili-Balkhash basin in order to incorporate the interests of the zone-source of water resources.

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4.9 Case study: Republic of Tajikistan: Reforming National Water Institutions

History and evolution of water authorities and organizations

There is a long history of water management in Tajikistan. The Soviet Socialist Republic of Tajikistan was established in 1924. People's Commissariat for Water Management and People's Commissariat of Agriculture of the Autonomous Republic of Tajikistan had been established in 1926 and functioned until 1938, when it was transformed into the Ministry of Water Resources.

In 1929 the Central Committee of the Pan-Russian Communist Party and Council of People's Commissars of the Soviet Union adopted the first resolution on construction of the first Vaksh irrigation system in Tajikistan. Construction dubbed Vakshstroy was started in 1931 and completed in 1933, providing irrigation for 72,000 hectares of land. In 4 years of its activities, the People's Commissariat for Water Management completed land improvement works in the area of 236 hectares.

In a very short time Vaksh, Khojabakirgan, Shurabad, Kirovabad, Farkhor, and Chubek irrigation systems were put into operation, enabling cotton cultivation in the Vaksh and Kurgantube, Khohozabada, Saraykamara (Panch), Gissar, Kafarnihan valleys, and certain areas of Kulyab.

More than 11 water reservoirs were built under the management of the experts of the Ministry of Land Improvement and Water Resources: Nurek, Boygozi, Sarband, Kayrokkum for generating electricity and irrigation of agricultural crops. Muminabad, Selbur, Katasoy, and Dakhanasoy water reservoirs were used for irrigation of orchards and other economic uses. In 1970 the area of irrigated land has reached 480,000 hectares, with 228,000 for cotton cultivation.

In the Soviet time, water management issues were strongly hierarchy from Moscow administration and Soviet principles of water allocation remain in force until new legal base was established in 2002.

Governance in the area of water utilization and protection is based on the combination of basin management, territorial, and administrative principles of management and implemented by the government of the Republic of Tajikistan, local executive bodies as well as the government bodies authorized to regulate water use and protection.

Current situation

The Government of Tajikistan has identified four special authorized government bodies for regulating the use and protection of waters:

- Ministry of Land Improvement and Water Management is a government management body for land improvement, water resources, agricultural water supply, and pasture irrigation. It is responsible for the practical implementation of water allocation and supply to the agriculture sector, and is in charge of the operation and maintenance of the infrastructure for irrigation and supply to the rural population. It collects the related water service payments.
- Ministry of Agriculture and Environment is responsible for government control over the utilization and protection of waters;

- Main Geological Department under the Government of the Republic of Tajikistan (ground waters);
- Committee for Government Control over Industrial Safety and Mining Controls under the Government of Tajikistan – control over rational utilization of treatment-based, mineral, thermal, and industrial ground waters as well as therapeutic mud.

In addition to these bodies, there are a number of organizations responsible for various dimensions of utilization of waters and agency-based protection:

- Ministry of Energy is responsible for regulation of universal water reservoirs;
- Khochagii manzili va kommunali State Unitary Company is responsible for drinking water supply and sewers in the cities and district centers;
- Ministry of Agriculture, Association of Dekhkans, Farmers, and Agricultural Cooperatives, Water Users' Associations are responsible for water use on farm level;
- Ministry of Health is responsible for control over sanitary and epidemiological situation at the sources of drinking water supply. It is in charge of a network of 73 sanitary epidemiological stations. These are struggling to do their job as their budgets have been slashed
- Local executive bodies are responsible for coordination of water use in their territories and setting the rules of water utilization, undertake activities for preservation and improvement of the current state of water sites, prevention and elimination of harmful impact as well as water pollution, reconstruction of facilities affected by accidents, flooding, mudslides, and other natural catastrophes.

All these State institutions have oblast and raion branches. Other entities are also involved. Fees related to the use of water and other resources are regulated by the Agency for Anti-Monopoly Policy and Support of Entrepreneurship. Ministry of Economy and Trade of Tajikistan coordinates the process of planning and forecasting regional utilization and protection of water resources.

The Tajik vodokanal units (in oblasts and raions) and Tajik kommunservis (housing and municipal services) operate water-supply and waste-water treatment facilities throughout the country. Community management bodies (mahalla, township council or street or block committees) can also monitor sustainable and rational utilization of water without the right to impose sanctions, exerting public pressure, and reporting the violations to the higher authorities.

This fragmented water management necessitates good relationships among the various ministries and bodies in charge of parts of the system. However, to date, there is little collaboration on this issue among the ministries, departments and municipal bodies. This hampers progress toward integrated water resource management, which is necessary to improve the situation. One example is the difficulty encountered in exchanging data between the State Committee for Environmental Protection and Forestry, which is in charge of measuring water quantities and quality through its Hydrometeorological Agency, and the Ministry of Land Reclamation and Water Resources, which needs such data for managing the water resources for irrigation. Therefore, the data on water resources are consolidated both by the State Committee, with data from its local branches, and by the Ministry. The drawing-up of a computerized water cadastre, which is ongoing as called for in the Water Code (art. 135), should streamline this issue.

The State Committee is expressly called upon to coordinate environmental activities with other ministries. However, it has not yet begun to coordinate inter – ministerial environmental activities. In part that could be attributed to the absence of a history of joint activities of various ministries except in the form of providing written comments to the Government on proposals developed by another ministry. An encouraging sign is that there are regular, if limited, joint activities between the State Committee's local offices and the hukumats.

The following conditions necessitate transition and development of national IWRM plan:

- Water resources are coming under increasing manmade pressure due to demographic growth, economic activities, and growing competition for water among users. Water diversion is increasing, matching demographic growth;
- Ever more intensive development means greater impact on the environment;
- Concerns about current climate changes requires better management of water resources in order to withstand floods and droughts;
- Agency-based approaches to the management of water resources still prevail as before, leading to uncoordinated utilization of water resources, which is increasingly evident than ever.

More than 400 of the 600 collective farms and state-owned farms that existed in Tajikistan have been reformed with establishment of more than 40,000 private farms on their lands. Overall, on-farm land improvement systems are managed ineffectively. On national level, water resource management is an institution inherited from central command system in transformation in light of market relations. Along with relatively high management standards on interfarm level, on-farm water management standards remain low.

In the act on Progress towards Millennium Development Goals in Tajikistan (2003) of the Government of Tajikistan (2003), implementation of integrated water management principles are also indicated among major objectives of sustainable development. This is also the favorable political environment for implementation of IWRM principles in Tajikistan.

Tajikistan has a relatively well-developed framework of primary laws for environmental protection and related issues, but this is less true for secondary legislation. Environment-related norms are set out in a number of general laws and laws applicable to specific environmental issues, procedures or types of natural resources.

The Water Code of Tajikistan adopted in November 2000 envisages the possibilities for changing ownership form of water management system in the procedures to be set by the Government.

Currently the Ministry of Water Resources of Tajikistan has developed the "Amendments to the Water Code of Tajikistan", cleared it with stakeholder ministries and agencies, got the approval of the Government of Tajikistan, and submitted to the Majlisi Oli (Tajik Parliament). For instance, the Section 1 stipulates Ownership rights and other rights for Waterworks, which for the first time states that waterworks can be in private ownership. The Water Code also includes provisions regarding Basin Management for Utilization and Protection of Water Resources and Objectives of Basin Water Management. According Article 25, the Basin Council will be responsible for approval of annual integrated water utilization and protection plan.

The Concept for Rational Utilization and Protection of Water Resources in Tajikistan developed in 2001 determines future courses of national water management system development. According to the Concept, in particular, the following is envisaged:

- Gradual transition to the systemic management method within hydrographic border, rather than administrative units;
- Accelerated establishment of water users' associations;
- Implementation of water demand management practices;
- Differentiated fees for water and its delivery depending on specific conditions;
- Development of diverse forms of private, collective, and joint-stock company-based water utilization in accordance with market-based principles of water management;
- Introduction of water-efficient technologies, particularly in the pump-irrigated zones.

Currently Water Sector Development Strategy of Tajikistan is under development (Ministry of Land Improvement and Water Resources of Tajikistan, UNDP, International Fund for Rescuing the Aral Sea Executive Committee). The objective of the water strategy is not unification of all sectors in the water management complex into an integrated economic system, rather an effective collaboration among them, implementing unified policies, making and implementing solutions delivering maximum economic and social benefits with minimum damage to the environment.

Across-the-board establishment of water users association (WUA) is an important area of agricultural and water sector reforms amid market conditions. Based on the assignment of the Government of Tajikistan (# 86/34 issued in 2000) joint order (prikaze) on approval of the Model Charter of Water Users' Associations of the Ministry of Land Improvement and Water Resources and Ministry of Agriculture has been issued.

New draft law on Water Users' Associations prepared (for the first time) by the Ministry of Water Resources has been adopted by the Government and Parliament of the country after approval by the stakeholder ministries and agencies.

Enabling environment has been created for implementation of IWRM principles, and consistent and systemic efforts are underway. There is an ongoing process of restructuring hydromelioration system and management, as well. Fee-based water use is shifting to the market-based rules, and development of differentiated tariffs. There is an ongoing process of turning over management rights to the water users, privatization of certain elements, and irrigation facilities. Implementation mechanisms of transition to IWRM are being prepared through preparation of new draft laws and regulations, which are supported by international institutions (UNDP, FAO, etc.)

In order to create the framework for implementation of the IWRM principles and transition, in the short-run it is envisaged to adopt the Laws on Water fees, Monitoring of Water Resources, Drinking Water Supply, Drinking water, etc.

It is planned to start public involvement in the water resources management along with establishment of Water Users' Association as the public non-government organization, based on which new institutions of water users may be established. They will gradually take over main canal management and water resources in general.

Based on the Civil Code, the first real WUA in Tajikistan was established in July 2000. In the framework of the projects to support agricultural privatization underway with the support of international financial organizations, about 40 WUAs were established in the area about 130,000 hectares (6 districts). In 2001 the recommendations were prepared for establishment and functioning of WUAs in the existing business and legal environment of Tajikistan. Across-the-board establishment of WUAs domestically, transition to the hydrographic principle of water resources management is the framework for broad application of IWRM principles as an alternative to the administrative and command management system.

One of the major IWRM principles is public involvement in the decision-making process of water resource management. NGOs are springing up in order to involve the public in decision-making on the matters related to water management, environment, socioeconomic issues in general, rational utilization and protection of water resources, thrifty water use in Tajikistan. NGOs such as Vodoconsulting, Drujina prirodni, Tabiat, Intervodproekt, etc. have already been set up.

The Government of Tajikistan made concrete steps to properly conduct water decade strategy (2005-2015), where main focus is on public involvement. The public is playing increasingly active role in

rehabilitation and construction of new waterworks through hashar (community work) methods and involvement in the projects of international organizations.

Under the Ministries and Agencies of Tajikistan (Authorized Government Bodies) there are units, which provide support and information services.

Government's Environmental Programme was approved in 1997 along with the resolution on Activities for implementation of Environmental Programme of Tajikistan in 1999-2008.

Clean water month is regularly held in the country, contributing to prevention of deterioration in water quality, improvement of the sanitary state of waterways and adjacent territories. Also the raids for inspection of sanitary state of water protection zones of rivers, canals, water sites, and underground water diversion points are being conducted.

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