

**PROSPECTS FOR INSTITUTIONAL CHANGE IN THE BLACK SEA  
CATCHMENT TO ADDRESS WATER QUALITY PROBLEMS**

by

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## ABSTRACT

The Black Sea is one of the world's most polluted bodies of water. Many years of unsustainable development and inadequate water management led to the catastrophic degradation of the Black Sea ecosystem. The most dramatic environmental problem stems from eutrophication. It is estimated that the Danube River contributes well over half of nutrient inputs to the Black Sea. While much progress can be achieved by countries acting individually, the transboundary nature of the problem requires international solutions through cooperation and coordination among countries included in the Black Sea marine catchment basin. This study aims at identifying incentives for cooperation among Danube and Black Sea countries for the protection and rehabilitation of this inland sea.

The institutional analysis and development framework developed by E. Ostrom and her colleagues is applied to examine the nature of institutional arrangements and assess prospects for change in the region. As the analysis demonstrates, Danube and Black Sea countries have thus far established the operational basis for integrated water management, and are in the process of financing the implementation of nutrient reduction measures. Because of the economic crisis that affects most Central and Eastern European (CEE) countries, governments' capacity to support environmental protection is limited. However, as the EU accession process moves forward, CEE countries are offered a strong incentive to more closely integrate environmental protection and economic development. Indeed, in order to draw from benefits associated with EU membership, applicant countries are required to adopt and apply the EU environmental policy. In member countries, this policy already contributes to reduce nutrient inputs to the North and Baltic Sea. It holds the potential to achieve the same result in the CEE countries that aspire to EU membership.

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## LIST OF ABBREVIATIONS

A	Austria
BG	Bulgaria
BH	Bosnia-Herzegovina
BS-SAP	Strategic Action Plan for the Rehabilitation and Protection of the Black Sea
BSEP	Black Sea Environmental Program
BSNN	Black Sea NGO Network
CEE	Central and Eastern Europe
CPR	Common-pool resources
CZ	Czech Republic
D	Germany
D-SAP	Strategic Action Plan for the Danube River Basin
DEF	Danube Environmental Forum
DPRP	Danube Pollution Reduction Program
DRPC	Danube River Protection Convention
DWQM	Danube Water Quality Model
EC	European Commission
ECE	Economic Commission for Europe
EPDRB	Environmental Program for the Danube River Basin
EU	European Union
FRY	Federal Republic of Yugoslavia
GDP	Gross Domestic Product
GEF	Global Environmental Facility
H	Hungary
HR	Croatia
IAD	Institutional Analysis and Development framework
ICPBS	International Commission for the Protection of the Black Sea
ICPDR	International Commission for the Protection of the Danube River
ILC	International Law Commission

IWM	Integrated Water Management
MD	Moldova
N	Nitrogen
NIS	Newly Independent States
NGO	Nongovernmental Organization
NPCI	National Per Capita Income
P	Phosphorus
PMTF	Project Management Task Force
RAC	Regional Activity Center
REC	Regional Environmental Center
RO	Romania
SAP	Strategic Action Plan
SK	Slovakia
SLO	Slovenia
TAR	Transboundary Analysis Report
TDA	Transboundary Diagnostic Analysis
UA	Ukraine
UNDP	United Nations Development Program
UNEP	United Nations Environmental Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UWWT	Urban Waste Water Treatment
WFD	Water Framework Directive

# CHAPTER 1: INTRODUCTION

## 1.1 Background and Rationale

The need for adopting an integrated and coordinated approach to water planning and development has become increasingly evident during the last decades. However, because of economic, political, and institutional constraints, progress made in applying integrated water management (IWM) has been rather disappointing. In international drainage basins, the difficulty of implementing integrated strategies is further complicated by the number and diversity of stakeholders, and states' reluctance to sacrifice part of their sovereignty. In order to overcome these barriers, analysts recommend developing joint participatory processes and institutions to structure the stakeholders' interactions. As part of this overall movement, riparian and coastal countries of the Danube and Black Sea expressed their intention to join their efforts to protect common water resources through the establishment of the Black Sea Environmental Program and the Environmental Program for the Danube River Basin. This research report examines how IWM is being applied in the Black Sea catchment, and defines the role played by institutions in this regional cooperative process.

Astride the Orient and Occident, the Black Sea is one of the world's most polluted bodies of water (Mee and Topping 1999). Degradation of the Black Sea is in large part attributed to its rapid eutrophication. Arising from intensive agriculture, and inadequate industrial and municipal water treatment, eutrophication generates each year colossal losses among Black Sea coastal countries. It is estimated that the Danube alone contributes well over half of the nutrient inputs to the Black Sea (ICPDR-ICPBS 1999). Eventually, the rehabilitation of the Black Sea will require that more resources be devoted to environmental protection, and that Danube and Black Sea countries cooperate on a more comprehensive basis. Coordination of the region's collective efforts to protect the Black Sea falls within the responsibility of the International Commission for the Protection of the Black Sea, and the International Commission for the Protection of the Danube River.

Despite the necessity of applying IWM in international drainage basins, only a few riparian and coastal countries globally have agreed to govern their shared water resources through comprehensive agreements. Instead, riparian and coastal countries tend to agree only on the development of accords expressing the lowest common denominator. Ultimately, greater importance should be given to the analysis of incentives for cooperation between countries sharing common resources. Since no nation will participate in a joint venture without the anticipation of retrieving some form of benefits, the identification of incentives for cooperation should be regarded as one of the first steps in the development of integrated basin institutions. The effectiveness of joint participatory processes depends on the countries' willingness to cooperate, because without this acceptance there is no compliance. This report examines how institutionally derived incentives for cooperation influence collective actions for the protection and rehabilitation of the Black Sea.

As it will be demonstrated in this study, the present state of economic and political transition in Central and Eastern Europe offers a unique opportunity for Danube and Black Sea countries to more closely integrate environmental protection and economic development. Since the collapse of USSR, political and economic restructuring processes have been directly related to the eastward enlargement of the European Union (EU). Indeed, in order to become full members of the EU, all applicant countries must meet specific criteria. Among the set of actions prescribed by the EU, all applicant countries must adopt and apply the EU water policy. Implementing this policy requires that applicants adopt a basin approach, build wastewater treatment plants, and reform agricultural practices (Grant, Matthews, and Newell 2000). By linking environmental protection to the accession process, the enlargement of the EU provides a great incentive for Central and Eastern European countries to increase environmental protection and strengthen international cooperation.

## **1.2 Statement of Purpose**

*General objective:* Examine the nature of institutional arrangements for the protection and rehabilitation of the Black Sea.

*Specific objective:* Assess prospects for change associated with the EU accession process on water management in the Black Sea catchment.

## **1.3 Report Organization**

The paper begins with a brief description of concepts and processes associated with the research problem. This literature review covers topics on common-pool resources, integrated water management, international drainage basins, and institutional theory. Chapter 3 presents the methodologies used while conducting this research, notably the analytical framework. Chapter 4 puts forward the key results of this institutional analysis, and Chapter 5 discusses the implication of these findings on water management in the Black Sea catchment. Finally, chapter 6 offers conclusions and recommendations for further research.

## CHAPTER 2: LITERATURE REVIEW

This chapter provides a review of the literature related to the application of integrated and coordinated strategies in international drainage basins. The first section presents the general problems associated with the management of common-pool resources. A special emphasis is given to collective action theories. The following section defines the concept of integrated water resource management, and gives a brief account of the management implications associated with the application of this approach. The third section describes the nature and characteristics of international drainage basins, and presents the challenges and opportunities inherent in their management. The chapter concludes with a discussion on the role of institutions.

### **2.1 Common-Pool Resources**

Throughout the literature, natural resources are divided into four broad types of goods, identified as private, public, and toll goods, and common-pool resources (e.g. Wade 1987, Oakerson 1992). Each of these four types differs in terms of its degree of subtractability and excludability. The former refers to the relative capacity of the resource to support multiple users without diminishing the overall level of benefits available to the group. The latter indicates the extent to which a particular resource may be controlled through limitation of its access (Ostrom, Gardner, and Walker 1994). By contrast with other types of goods or resources, common-pool resources (CPR) are highly subtractable and it is difficult to control access to them. Examples of CPRs include wildlife, grasslands, groundwaters, and oceans.

The key problem for ensuring the sustainable development of CPRs consists in determining how to coordinate the level of use by numerous actors in order to obtain an optimal rate of production or consumption (Oakerson 1992). Achieving coordination in a CPR system is severely restricted when open-access characterises such resources. Since it is difficult to exclude or even control the rate of appropriation of resource units by users, the temptation for some participants to over-extract from such a resource is high

(Wade 1987). In such cases, individual rationality can lead to irrational outcomes for the group. This report refers to the term – actor- to describe all individuals and organizations that have become participants in a CPR situation.

In his book *The logic of collective action*, Mancur Olson (1965, 110) argues that “in large groups deprived of devices to make individuals act in their common interest, rational, self-interested individuals will not act to achieve their common group interests”. Since no mechanisms can ensure that a rational common objective will be implemented by all, some actors prefer to settle for suboptimal, but more reliable and independent, outcomes. Applying this principle to herders sharing a common pasture, Hardin’s “tragedy of the commons” illustrates how environmental degradation can occur when individuals use scarce resources in common (Hardin 1968). In the absence of mechanisms internalizing the costs of deteriorating a resource and ensuring compliance within a group of appropriators, users are condemned to act in their own short-term self-interest (Pinkerton and Weinstein 1995). Despite the collective and long-term rationale for resorting to cooperative strategies, and internalizing the costs of environmental degradation, some appropriators will choose to use as many resource units as they can now rather than taking the risk of letting other users gain from their restrained consumption.

Fortunately, users sharing common resources have on numerous occasions succeeded in overcoming the tragedy of the commons. In practice, such tragedies occurs in extreme cases where resource appropriators cannot communicate effectively with one another, which compromises their capacity to establish and enforce common strategies. Extending Hardin and Olson’s work, Elinor Ostrom refers to the notion of a CPR dilemma, when appropriators’ strategies lead to suboptimal outcomes but institutionally feasible alternatives exist to prevent such losses (Ostrom, Gardner, and Walker 1994).

Coordination of the appropriators’ strategies represents the key to solving this kind of CPR dilemma. While coordination can be attained spontaneously through a learning and incremental process over time, coordination can also be induced more proactively by changing the rules affecting the structure of the situation (Ostrom, Gardner, and Walker 1994). Rules refer to “agreed upon and enforced prescriptions that require, forbid or

permit specifications for more than a single individual” (Schlager and Ostrom 1990, 14). Designed to define who decides what in relation to whom, rules create incentives that can lead individuals and organizations to interact in more productive ways (Oakerson and Walker 1997).

Rules form institutional barriers and bridges that facilitate coordination and cooperation among appropriators of a common resource in order to achieve optimal outcomes (Gunderson, Holling, and Stephen 1995). For rules to fulfill such purposes, it is essential that they address both appropriation and provision problems related to the utilization of a resource (Ostrom, Gardner, and Walker 1994). Rules developed should ensure that the level of inputs withdrawn do not exceed the natural yield of a resource, and guarantee that the stock of the resource is maintained both in terms of its quality and quantity. In addition, rules are aimed notably at reducing externalities arising from the potential for open-access with CPRs (Ostrom 1990). Externalities consist in “added costs that a user inflicts on other users, and that are external to that user but internal to the group” (Field and Olewiler 1994, 75). Accordingly, any qualitative or quantitative alteration made by one user to a resource stock or flow will have repercussions on all users, either in terms of increased efforts required to treat a polluted resource, or to appropriate resource units that are becoming more scarce.

Although no single formula exists to solve all CPR dilemmas, the literature demonstrates that CPR appropriators are committed to collective actions in situations where participants are clearly defined, patterns of organization reflect the attributes of the CPR and the community, and rules implemented are monitored and enforced (Wade 1987, Oakerson 1992). Collective action theorists now accept that restrictive variables such as the size of a CPR, or the number of appropriators, can be mitigated by enhancing communication among users, building trust, and extending reciprocity (Ostrom, Gardner, and Walker 1994).



## **2.2 Integrated Water Management**

Since its first expression in the early 20<sup>th</sup> century, the concept of integrated water management (IWM) has evolved with the development of environmental science, and moved away from its strict focus on the drainage basin (Mitchell 1990). Giving recognition to the intrinsic value of the environment, the 1972 Stockholm Conference on Human Environment introduced the notion of “ecosystem” to natural resource management (Teclaff 1996). As noted during the conference, natural resources should not be managed as mere production inputs but more as ecological systems in which physical, chemical, and biological processes interact with one another (Mitchell and Shrubsole 1994). In the mid 1980s, the Brundtland Commission on sustainable development expanded this systemic approach by linking environmental protection with economic development (Chiras 1994). The concept of sustainable development also implies that natural resources should be managed on a holistic basis accounting for the views and goals of present and future stakeholders (Chiras 1994). Reporting on the evolution of water management practices, the Dublin Statement on Water Management and Sustainable Development defined IWM as a “cross-sectoral framework for managing human activities in an area defined by the drainage basin in order to ensure the sustainable development of land and water resources” (Duda and La Roche 1997).

Since water systems rarely coincide with political and administrative boundaries, IWM uses the natural hydrological unit, the drainage basin, as a basis for planning and decision-making (Waterbury 1997). A drainage basin, or watershed, is the area of land from which surface run-offs flow to a common outlet at some point along the water system (Dunne and Leopold 1996). According to management objectives, the size of a drainage basin can vary from that of the Amazon River to a small gully of a few square meters. Planners refer to a river basin as “the area of land drained by a river’s entire drainage system, from which all surface run-offs flow through a sequence of streams, rivers, and lakes into the sea at a single river mouth, estuary or delta” (European Parliament 2000, 17). Regardless of the scale selected, a drainage basin is always part of some larger drainage system whose downstream portion may suffer from upstream disturbances. Given that pollutants from inland areas inevitably end-up in regional seas,

integrated management should account for interconnections between freshwater and saltwater systems (Alexander 1993). Sherman and his team (1993) describe marine catchment basins as large marine ecosystems “encompassing coastal areas from river basins to the seaward boundary of continental shelves and the seaward margins of coastal current systems”.

As defined by West (1999, 360) the integrated approach “recognizes the river as an active, interconnected entity which depends upon its waters, the land surrounding the river, and the groundwater of the basin that recharges the river”. Thus, a drainage basin might be regarded as an ecosystem continuum formed of a succession or superposition of ecosystems from headwaters to mouth (Teclaff 1996). Any alteration made on the basin’s dynamic will have repercussions throughout the watercourse system in term of adjustments of volume, rate of flow, sediment load, and water quality (Teclaff and Teclaff 1985). Obviously, the basin approach acknowledges that a system of interrelated problems should be managed as a system, but also favors the adoption of cost-effective initiatives maximizing the level of improvement at the lowest cost (Moster 1998). Basin strategies take advantage of regional variations in the water system.

Because humans are a fundamental component of ecosystems, integrated resource management stresses the importance of analyzing relationships between humans and the environment, and between individuals and organizations involved or affected by the management process (Imperial 1999a). Watson (1996, 47) defines integrated resource management as “the sharing and coordination of the values and inputs of a broad range of agencies when conceiving, designing and implementing policies, programs or projects”. This definition raises two key issues. First, integrated management is based on joint decision making aimed at balancing the perceptions and interests of all stakeholders (Watson, Mitchell, and Mulamoottil 1997). Ultimately, strategies adopted will reflect the multiple purposes and means of the participants. Second, the involvement of multiple participants will prove effective only if well coordinated among stakeholders at all levels (Ostrom 1992). Without cooperation and coordination, the policies that are implemented

might be inconsistent between and across levels of governments, or lead to duplications of responsibilities (Imperial 1999a).

Over the last decades numerous attempts have been made at all scales to better coordinate management functions among stakeholders within drainage basins. Thus far, practical experience has yield mixed results (Watson, Mitchell, and Mulamoottil 1997). The implementation of integrated strategies proves to be hindered by a series of constrains including inadequate financial provision, weak legislation, fragmented administrative structures, entrenched organizational cultures, and limited public participation (Watson, Mitchell, and Mulamoottil 1997). In international drainage basins, cooperative solutions are further impeded by the large number and heterogeneity of stakeholders, the sovereignty of national actors, and the unidirectional distribution of externalities (Waterburry 1997).

### **2.3 International Drainage Basins**

As an example of a common-pool resource, international watercourses and regional seas are characterized by the subtractable nature of the resource. In such systems, all resource appropriators are interconnected. Any alteration made by one user diminishes the quantity or quality of shared resources available to other users. In international drainage basins, the efficient use and effective conservation of water resource requires cooperation among all countries within a catchment basin (Nakayama 1997). Applying integrated water management in international drainage basins proves to be difficult because of sovereignty issues and the different patterns of incentives affecting users (le Marquand 1977). Most international drainage basins are not governed by any comprehensive agreement (Milich and Varady 1997).

In international drainage basins, riparian and coastal countries are confronted with different incentives to cooperate . Since water flows unidirectionally, externalities associated with water consumption are distributed asymmetrically among the basin countries (Linnerooth 1990). In general, upstream countries have the opportunity to export their externalities downstream, which results in a mismatch between the costs and

benefits of polluting or abating the flow of water. Despite the OECD adoption of the polluter pays principle, in many situations the efficient solution of unidirectional externalities requires that downstream countries accept the victim pays principle (Maler 1992). Regional differences between countries also can lead actors to adopt divergent management strategies. States with different political and economic status, and different production technologies, often have dissimilar priorities and objectives (Shmueli 1999).

Sovereignty concerns represent another obstacle for countries to adopt integrated basin strategies (Le Marquand 1977). Any international agreement limits a states autonomy and flexibility. States are particularly reluctant to sacrifice part of their sovereignty over their most precious development resource (Duda and La Roche 1997). As a result, most international water treaties contain general and vague prescriptions. Le Marquand (1977) refers to the concept of interdependency costs to reflect a states' sovereignty concern. Interdependency cost represents "the general loss of independence or loss of control over one's own activities, resulting from the accumulation of collective constraints" (Le Marquand 1977, 14). In basins including developed and developing countries, sovereignty concerns often take precedence over cooperation (Duda and La Roche 1997). Developing countries are most reluctant to allow industrialized nations to increase control over their development, especially for implementing environmental measures that will restrain their short-term growth (Chiras 1994).

Despite the significance of obstacles in the way of integrated basin development, several other factors can influence the propensity of riparian and coastal countries to cooperate (Chitale 1995). First, states may agree to contract international water agreements in order to gain concessions in other policy areas. Such a linkage process may allow countries to form a "reservoir of good will" to draw from on other bilateral and multilateral negotiations (Le Marquand 1977). Second, states may choose to structure their relationships based on reciprocity (Ruggie 1992). In numerous sectors such as commerce and security, reciprocal commitments permit states to draw benefits that would be otherwise unavailable. Third, states sometimes adopt strategies to enhance their image within the international arena (Le Marquand 1977). For instance, powerful countries may

decide to undertake actions that do not represent their best interest, but that will make a favorable impression on public opinion in other countries (Le Marquand 1977). As the Colorado example indicates, non-economic factors can play an important role in the negotiation of international environmental agreements. Indeed, in an attempt to cultivate more favorable relations with Latin American countries, the Nixon administration supported the construction of a desalination plant on the Colorado to improve water quality in downstream Mexico (Milich and Varady 1998). Although most of the visible benefits accrued to Mexico, this project was justified because it contributed to ease negotiations over the management of the Rio Grande (Maler 1992). On this river, most of the water originates in Mexico, and upstream pollution affects the downstream American farmers.

Finally, international water law may also determine countries to adopt integrated strategies. Although international water law has no legal baring, it provides a common framework for managing transboundary watercourses (Waterbury 1997). Since there is no international enforcing authority, states apply international law to avoid setting unfavorable precedents that could be used against them in other negotiations (Le Marquand 1977). The principal body of international water law is expressed in the United Nations' *Convention on the Law of the Non-Navigational Uses of International Watercourses* (Chitale 1995). There are two fundamental principles related to international water law. The first principle refers to the notion of equitable use, and the second to the notion of appreciable harm (Utton 1996). Both principles are drawn from the doctrine of "limited territorial sovereignty", which acknowledges the right of countries to reasonably use water from an international waterway, and recognizes that one should not cause harm to any riparian countries (Duda and La Roche 1997). The International Law Commission (ILC) defines equitable utilization on the basis of factors such as past and existing water utilization, economic and social needs of riparians, and the availability of alternative sources (Wolf 1997). According to ILC, the expression of harm entails that there is an actual impairment of use, injury to health of property, or detrimental effects on the ecology. Stephen McCaffrey, special rapporteur for the ILC,

defines appreciable harm as a form of impact “that is not trivial but less than significant” (Waterbury 1997).

As the literature demonstrates, progress in international drainage basins has been slow (Waterbury 1997). However, it is widely accepted that specific conditions promote and facilitate basin-wide cooperation. These include: (i) countries share the same technical perception of the problem, (ii) countries have a similar desire for environmental quality, (iii) the international policies of countries respond to parallel domestic priorities, and (iv) technical and financial assistance is available from a neutral third party (West 1999). In all cases, cooperation requires the development of joint participatory processes to structure collective efforts (Duda and La Roche 1997).

## **2.4 Institutional Theory**

A review of resource management literature suggests that rather than technical capacities, it is limitations in institutional capacity that constitutes the main barrier for improving resource management (Watson, Mitchell, and Mulamoottil 1997). Indeed, Watson (1996) argues that all resource management problems are fundamentally institutional, and therefore warrant institutional solutions. The literature indicates that it is often possible to overcome resource management problems through the development of institutional arrangements that maximize incentives to cooperate between resource stakeholders and support coordination of their activities (Imperial 1999a). Institutions can be created to encourage individuals and organizations to adopt different strategies and behaviours that can lead to changes in outcomes (Ostrom 1992).

Crawford (1995, 450) defines institutions as “enduring regularities of human action structured by rules, norms, shared strategies and the realities of the physical and technological world”. As a coherent set of principles that organize ensembles of practices, institutions result of implicit and explicit efforts to achieve order and predictability within a defined situation (Schlager and Ostrom 1990). In this report, the term institution refers to all structures and processes influencing actors’ behaviour, thus, it comprises both bureaucratic organizations and decision-making arrangements.

The logic of institutional theory is based on the assumption that the environment in which actors make decisions is material as well as social (Oakerson and Walker 1997). In such environments, actors' identities and interests are constituted by both physical and institutional elements (Adler 1997). The former determinates what is possible, and the later specifies what is permitted, required, or prohibited. It is through their effect on incentives that institutions shape the actors' behaviours and their patterns of interaction (Ostrom 1992). Incentives consist in the perceived link between individual choice and outcomes, and are defined by Ostrom (1992) as positive or negative outcomes that actors estimate as likely to result from particular actions. By altering the structure of obstacles and inducements that actors naturally face, institutions shape the choice of actors. From individual choices emerge patterns of interaction which, in turn, produce outcomes (Oakerson and Walker 1997)

Institutions operate as a set of filters and lenses that highlight or tone-down a particular stimulus, and focus specific choices towards the attainment of common objectives. Institutional arrangements shape behaviour by restricting the range of strategies available to individual choice, and guiding actors through the decision making process (Blomquist 1992). Crafted from rules, institutions ensure that actors confronted by a similar set of incentives react to their environment in a manner consistent with social objectives. In a situation deprived of institutions, actors would be submerged by the quantity and diversity of stimuli, and condemned to respond to their environment strictly on the basis of their personal experiences, ambitions, and expectations.

As shared knowledge, institutions shape patterns of interaction by providing stability of expectations between actors subject to the same set of rules (Kaminski 1992). In the process of choosing their strategies, actors produce a mental image of obstacles and inducements relevant to their environment (Oakerson and Walker 1997). An important element of this process relates to how others are expected to behave. Given that actors confronted to similar incentives are expected to react in a like manner, the creation of

common expectations facilitates the interpretation process by decreasing uncertainty (Imperial 1999b).

As an element of social construction, institutions are developed to structure relationships among actors in order to achieve collective outcomes (Adler 1997). The literature demonstrates that the process of crafting institutions to create new forms of relationships has been utilized and studied in a variety of settings to address a wide range of problems. In regard to CPR systems, institutions have been developed to control small-scale irrigation systems such as in Nepal (Lam et al 1997), to govern massive groundwater basins as in California (Blomquist 1992), and to foster cooperation between coastal countries such as in the Baltic Sea (Gunderson 1995). In all cases, regardless of the scale, the creation of common expectations through institutions contributed to developing a sense of community and moral responsibility, which eventually led to some level of collective actions.

Developing institutions to achieve collective outcomes proves extremely challenging and complex. Unlike physical laws, rules and institutions have no significance outside human language (Ostrom, Gardner, and Walker 1994). Since words already represent a simplification of reality, rules crafted from words face the problems of lack of clarity or misunderstanding (Ruggie 1992). The effectiveness of rule-ordered actions depends upon shared meanings assigned to words used to formulate rules (Imperial 1999a). Different interpretations cannot lead to regularities in actions. Moreover, outcomes expected from rules are not automatically achieved, and rest on future choices of numerous individuals and organizations (Ostrom 1990). In order to achieve desired outcomes, rules must be interpreted uniformly and their application must be monitored and enforced. Given these constraints, institutional changes involve a series of small steps rather than totally reconstructive or destructive changes (Imperial 1999a). Such an incremental and sequential process allows participants to slowly develop their capacity to work collectively and manage complex problems (Adler 1997).



In the end, the challenge of crafting institutions to resolve CPR problems is to ensure that institutional arrangements are designed to match the physical and social context. Unless institutions reflect the attributes of the CPR and its community of users, they cannot produce the incentives required to change the actors' behaviour. In international catchments, institutions crafted to apply IWM must adopt the drainage basin as the basis for planning, account for the unidirectional distribution of externalities among users, and respect the states desire to protect their sovereignty. The next chapter presents this study analytical approach and research methods.

## CHAPTER 3: APPROACH AND METHODS

Institutional analysis provides the main methodological framework for this research. The purpose of institutional analysis is to understand the effects that institutionally derived incentives have on human behaviour. To structure the analysis, this research adopts the Institutional Analysis and Development (IAD) framework developed by E. Ostrom and her colleagues. This institutionalist framework is used to sort out data and highlight key concepts and relationships that are most likely to influence an actor's choices. Applying the IAD framework involves presenting contextual attributes, dissecting the decision space, and assessing the institutional performance. Within this framework, data and information were gathered using three research methods: literature review, structured interviews, and documentation analysis. This chapter provides an overview of the analytical framework applied to examine institutional arrangements in the Black Sea catchment and presents the research methods used to collect data.

### **3.1 Analytical Framework**

The purpose of this project is to identify how organizational structures can prompt a group of actors sharing a common resource to achieve collective outcomes. Throughout social sciences, researchers examine the effects that organizational structures have on behaviour. Depending on their disciplines, researchers refer to the analysis of organizational structures in terms of implementation structures (Hlern and Porter 1981), interorganizational policy systems (Milward and Wamsley 1982), advocacy coalitions (Sabatier and Kenkins 1993), and institutional arrangements (e.g. Ostrom 1990, Watson, Mitchell, and Mulamoottil 1996, Day and Georgison 1993). Elinor Ostrom and her colleagues developed the Institutional Analysis and Development (IAD) framework to organize theoretical and empirical studies within the policy field (Ostrom, Gardner, and Walker 1994). The framework has been applied to analyze a wide range of issues. It has been used for studying public goods, common-pool resources, metropolitan organizations, and privatization processes in developing countries (Imperial 1999a). Despite the framework's original focus on small scale and local structures, several researchers have

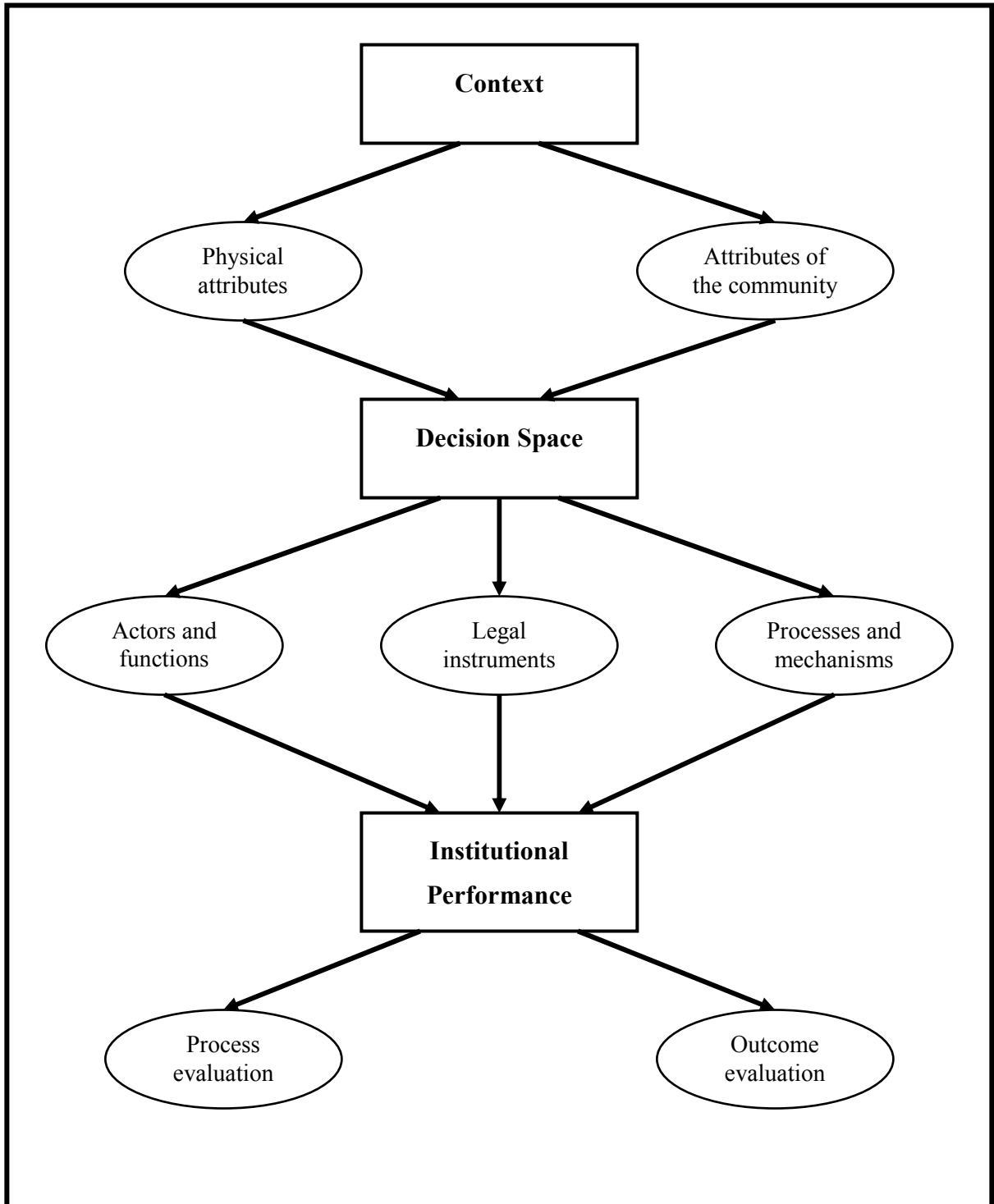
applied the IAD framework to study larger phenomenon such as macro political systems (Kaminski 1992) and interbasin water diversions (Blomquist 1992).

The conceptual framework used for this report decomposes the analysis of CPR situations into three stages, which involves defining the context and decision space, and evaluating institutional performance. This framework can be used for both diagnostic and prescriptive purposes (Oakerson 1992). By working forward through relationships, this research aims at defining how to modify patterns of interaction through institutional changes (fig. 3.1). This institutional analysis starts with the examination of contextual attributes. This requires defining the nature of the problem, and presenting the attributes of the community of resource users (Imperial 1999a). Then, the analysis proceeds with the decomposition of the decision space. The decision space, or action arena, represents the social space where actors interact, and is composed of actors, legal instruments, processes, and mechanisms. The analysis concludes with an assessment of institutional performance. Given the early stage of institutional development in the Black Sea catchment, the evaluation is based on the institutions' procedural capacities and anticipated outcomes. To gain a better understanding of this approach it is appropriate to explore each of these stages in more depth.

### **3.1.1 Contextual Attributes**

Grounded in institutionalist theory, this study presupposes that individuals make decision based on incentives derived jointly from material and social pressures (Adler 1997). Accordingly, the framework distinguishes two sets of variables that can be used to describe common-pool resource situations: (i) physical and technical attributes, and (ii) attributes of the community. Each set of variables is interrelated between one another. In mapping the contextual attributes, the emphasis is put on both opportunities and constraints (Oakerson and Walker 1997).

**Figure 3.1: Institutional Analysis and Development framework**



Source: Ostrom, Gardner, and Walker 1994

The IAD approach suggests that to be effective, institutional arrangements must be compatible with the underlying physical and technical setting (Oakerson 1992). Indeed, physical-technical properties constitute hard constraints to which human beings must adapt (Adler 1997). For this reason, institutional analysis starts with the definition of the physical-technical variables that limit the actors choices. In regard to common-pool resource situations, these constraints stem mainly from a resource's degree of subtractability and open-access. Defining the nature of the problem implies specifying the capacity of the resource to support multiple users and determining the conditions and degree to which the resource can be controlled by limiting access to it (Coccosis, Burt, and Van Weide 1999). The definition of the physical setting includes all other relevant geographical and biological attributes that may represent constraints or opportunities for users and planners (Imperial 1999b). Given the large size of some resource systems and the heterogeneous distribution of resource units within resource systems, it is necessary to identify physical boundaries dividing a resource system (Ostrom 1999). Other situational variables such as the state and the size of the resource system must also be accounted for.

Institutional arrangements are by their nature social constructions reflecting identities and interests of communities (Adler 1997). Given that common understandings and shared interpretations are the basis upon which institutions acquire meaning, institutional arrangements are more likely to prove effective if they are congruent with the cultural attributes of the community from which they originate (Ostrom 1992). Thus, the IAD framework draws attention to the necessity of defining the "cultural attributes" of a community to determine the nature of these shared understandings. To appreciate these attributes requires an analysis of the dominant socio-economic characteristics of the community and an understanding of how actors conceive their relationships with one another (Imperial 1999a). The key variables of such a structural analysis include the number of actors involved, the homogeneity of the actors' preferences, the level of common understanding, and the distribution of resources among members of a community (Imperial 1999a).

### **3.1.2 Decision Space**

This institutionalist approach refers to the notion of decision space to describe the social space where actors involved in a common situation interact and make decision. A decision space is composed of three components: (i) actors, (ii) legal instruments, and (iii) processes and mechanisms. The basic strategy consists in defining who is involved in a situation, what set of rules influence actors' choices, and how participants structure their relationships

Defining the actor component involves identifying group organizations that have become participants in a situation (Ostrom, Gardner, and Walker 1994). In many situations, especially in international settings, the number of participants exceeds the capacity of current theoretical tools to analyze. In such cases, analysts must focus on the most important and influential actors. For representativity, the selection of actors must respect the physical and social attributes of a situation. While analysis conducted at the local scale emphasizes the role of individuals and basic group organizations, macro analysis focuses on higher levels of organizational structures. Given that international relations are bounded by sovereignty issues, states represent the most legitimate and powerful authority within international arenas (Ruggie 1992). It is the states that decides which issues are to be considered by the international community and who negotiate international legal instruments (Porter, Brown, and Chasek 2000). However, nonstates actors such as international organizations and nongovernmental organizations also play an important role in global environmental politics. Increasingly, nonstates actors contribute to setting the agenda for global environmental issues and participate in the development of normative codes of conducts.

In order to understand how actors behave and interact, analysts must determine the preferences that actors assign to potential actions and outcomes, and specify the resources that each actor brings to a situation (Ostrom, Gardner, and Walker 1994). As rational entities, actors are expected to choose strategies that maximize utility (Field and Olewiler 1994). Rational actors take actions that will materialize their preferences. Thus, defining an actor preferences allows analysts to understand the rationale behind an actors'

strategies. In the process of defining an actor's motivations, special attention should be given to an actor's financial capacity to implement his or her preferred strategies (Coccosis, Burt, and Van Weide 1999). Budgetary constraints limit the set of actions available to participants. Uneven distribution of resources among actors may create power asymmetries that can affect the actors' relationships (Shmueli 1999).

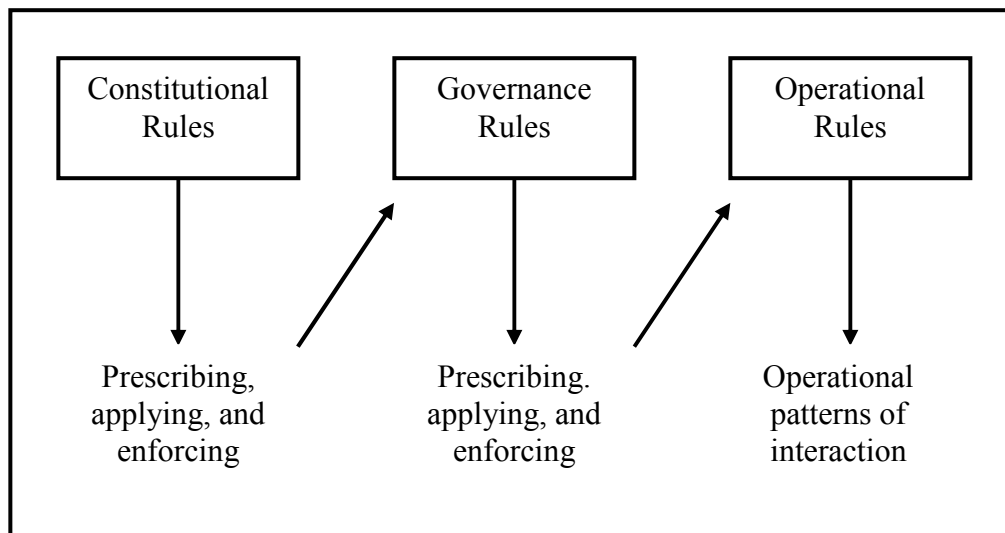
Defining the actor component also implies specifying how management functions are distributed among actors at different scales, and within different hierarchies (Watson, Mitchell, and Mulamootil 1997). Management functions refer to the set of actions that participants are authorized to undertake under conditions prescribed by rules (Mitchell 1990). In regard to international drainage basins, the principal management functions include planning, policy-making, coordinating, implementing, and enforcing (Coccosis, Burt, and Van Weide 1999).

Since institutions are crafted from rules, a central point of institutional analysis is to identify legal instruments that affect the actors' choices. Assuming that incentives generated by the physical world and the nature of the community are modified by institutional arrangements, the IAD framework draws particular attention to rules-in-use. As defined by Ostrom (1992, 19), these refer to "the set of rules actually used by individuals to organize repetitive activities that produce outcomes affecting these individuals and potentially others". Rules-in-use can take various forms and originate from multiple sources. Although informal, or *de facto*, rules certainly contribute to solving local CPR problems, this report considers only those rules that were given lawful recognition by formal or legal instrumentalities. In addition to being more accessible, formal or *de jure* rules are more likely to generate changes that are observable at the macroscale (Adler 1997).

Taken individually or apart from their context, rules are meaningless. In practice, all rules are nested within a higher order that defines how these rules can be changed (Ostrom, Gardner, and Walker 1994). Analysts normally distinguish three levels of rules: (i) operational, (ii) governance, and (iii) constitutional (Oakerson and Walker 1997). The

operational level relates to the set of rules that apply immediately to the physical world and affect decisions on a day-to-day basis (Pinkerton and Weinstein 1995). In regards to CPRs, operational rules can take the form of prescriptions that specify the type of uses accepted, or the amount of resource units that can be appropriated by a particular type of user. Standing alone, operational rules are ineffective. Governance structures assign and distribute discretionary authority to prescribe, apply, and enforce operational rules (fig. 3.2). Governance rules establish the conditions of collective action and decision making. As with operational rules, the integrity of governance rules depends on a higher level that keeps the exercise of authority within prescribed limits (Oakerson and Walker 1997). These constitutional rules configure governance structures by specifying who prescribes, applies, and enforces governance rules. Given the number of rules at all three levels, the analysis of institutional attributes must account only for the rules that are the most significant in term of their effect on a situation.

**Figure 3.2. Institutional analysis at multiple levels**



Source: Oakerson and Walker 1997

Resolving collective action problems requires more than actors who are willing to cooperate and clearly defined legal instruments. The larger the group, the more participants must depend on processes and mechanisms to aid coordination and resolve internal conflicts (Kaminski 1992). By definition, processes refer to structuring



enterprises, and mechanisms allude to integrating exercises. For instance, processes such as benefit-cost analysis, environmental assessment, environmental planning, public participation, and regional planning processes are often used to solve problems and increase dialogue among stakeholders (Watson, Mitchell, and Mulamoottil 1997). At the political level, actors may choose to rely on interministerial councils as mechanisms for deliberating on common issues (Mitchell 1990). At the bureaucratic level, mechanisms used include interdepartmental committees, task forces, and commissions. Fundamentally, all processes and mechanisms are developed to enhance communication among actors, which contributes to build trust and reciprocity (Ostrom 1990).

### **3.1.3 Institutional Performance**

Institutions are the result of implicit and explicit efforts to achieve collective outcomes. The purpose of evaluating institutional performance is to determine whether, and how well, institutions achieve their intended outcomes (Blomquist 1992). Rich (1979, 11) defines evaluation as “the process of assessing whether or not desired outcomes have been reached, of specifying or explaining the outcomes that were reached, and of suggesting new strategies and definitions of future problems”. While a precise assessment of institutional performance is beyond the scope of this analysis, it is important to determine under what conditions institutions shape an actor’s behaviour. The evaluation conducted for this research is based on processes and outcomes. Process evaluation aims at identifying the strengths and weaknesses associated with the negotiation and operation of institutional arrangements (Imperial 1996). Outcome evaluation estimates the capacity of institutions to achieve their intended outcomes (Patton 1990).

Process evaluation can be helpful to identify areas for improvement and prospects for changes. This study uses transaction costs to examine the present performance of institutional arrangements. Transaction costs refer to the cost of searching and enforcing agreements (Field and Olewiler 1994), and can be divided into three categories: (i) information costs, (ii) coordination costs, and (iii) strategic costs (Imperial 1999b). Information costs are associated with the cost of searching and organizing information. Coordination costs comprise those needed for negotiating, monitoring, and enforcing

agreements. While several institutional and relational factors affect coordination costs, the literature demonstrates that such costs increase as the number of participants rises (Imperial 1999a). Strategic costs result from asymmetries between actors such that some obtain benefits at the expense of others. In CPR situations, the most common opportunistic strategy is free-riding (Oakerson and Walker 1997). Free-riding occurs when some participants deliberately choose to benefit from collective efforts without contributing to the process. Non cooperative strategies erode reciprocity, which undermines the possibility of achieving collective outcomes (Oakerson 1992). By examining strategic costs, analysts can identify the set of variables that lead actors to adopt non cooperative behaviours.

Outcomes can be evaluated from two perspectives, either as actual achievements or as anticipated results. Given the early stage of institutional development in the Black Sea catchment, this research focuses on the institutions likelihood to generate the desired outcomes. Since outcomes cannot be analyzed in a “value-free” manner, the IAD framework draws on evaluative criteria such as effectiveness, efficiency, and equity to assess anticipated outcomes (Imperial 1999b). Effectiveness focuses on establishing whether an institutional arrangement achieves what its designers intended (Blomquist 1992). In resource management, considerations of institutional effectiveness are evaluated in terms of the institutions’ contribution to the improvement of ecosystem health. The economic criterion of efficiency is viewed in terms of cost-effectiveness. Environmental-related institutions are considered cost-effective when they produce the maximum environmental improvement possible at the least cost (Field and Olewiler 1994). The equity criterion is evaluated from the perspective of fiscal equivalence and redistributive equity. The former refers to the distribution of benefits among participants, and the latter accounts for the actors’ ability to pay (Blomquist 1992). Clearly, no institution can maximize all three criteria simultaneously. Therefore, analysts assessing outcomes need to consider and evaluate tradeoffs between and among criteria. Institutional arrangements are judged optimal when they reduce the severity of tradeoffs.

## 3.2 Research Methods

Given the limitations and biases inherent to all research methods, social scientists often rely on multiple methods to strengthen a study's robustness (Singleton and Straits 1999). The logic is that different methods producing similar findings increase confidence in the results. By combining methodological approaches, researchers can validate one source of information with another. The strengths of one method compensate for the weaknesses of other methods. The key to such a cross-checking exercise is to adopt research methods that do not share the same methodological weaknesses (Yin 1994). In this study, data and information were gathered based on three research methods, including: (i) literature review, (ii) structured interviews, and (iii) documentation analysis.

As presented in the previous chapter, the literature review conducted for this study provides much of the background information associated with this research topic. Based on professional and academic publications, the literature review establishes the theoretical context of the research (Bourner 1996). Since all disciplines generate information focussing on different dimensions of a research problem, a thorough literature review must consider all disciplines impacting on the study. Cooper (1989) suggests reviewing the literature according to three phases. The first phase, or broad scan, serves to increase knowledge of contents and methodologies. The second phase aims at defining major issues and identifying opposing views within the literature. The last phase concerns the assessment of specific works, with detailed analysis of trends and controversies, and includes firm evidence to support a research problem. Fundamentally, the information generated from a literature review serves as a basis for comparing the study results with previous research to determine if there is consistency between the research findings (Yin 1994).

Structured interviews provided much of the information required for this research. The literature demonstrates that if the instrument is well prepared and respondent motivated, interviews constitute a very reliable and valid source of information (Adams and Jay 1989). Indeed, interviews allow researchers to reveal information that would be otherwise unavailable. For this research, respondents were sought for their personal experience

regarding water management programs in the Black Sea catchment. Interviews were conducted with key officials of the main water agencies, ministries, research institutes, and NGOs dealing with the subject (appendix I). For representativity, at least one respondent was interviewed from each geographical subdivision and for each administrative level (Seidman 1991).

This research uses focused interviews to structure data collection. Unlike standardized interviews for which questions are precisely worded, focussed interviews are essentially goal oriented (Adams and Jay 1989). Assuming that all respondents share some common knowledge, the interviews focus on attaining the research objectives. In order to fulfill these objectives, an interview guide was designed. The interview guide used for this research is presented in appendix II. As defined by Patton (1990), the interview guide consists of “ a list of questions or issues that are to be explored in the course of an interview”. Basically, the interview guide serves as a checklist to ensure that all respondents cover the same material. Hence, the interview guide makes interviewing across different respondents more systematic and comprehensive (Patton 1990).

Even though there are no fixed rules for conducting focused interviews, Patton (1990) recommends developing the interview guide based on a format of open-ended, single, and neutral questions. Open-ended questions offer the advantage of letting a respondent reveal what he or she thinks is important, and the amount of information necessary to cover a topic (Stewart and Wash 1978). By treating one idea at a time, without presuppositions, single and neutral questions avoid confusion and reduce biases (Patton 1990). In order to structure and facilitate the exchange of information between a respondent and the researcher, interview guide uses a funnel sequence (Steward and Wash 1978). All interviews started with broad questions and ended with specific and more sensitive questions. This funnel structure is further emphasized by using primary and secondary questions. The former introduces the topics to be discussed, and the later elicited further information (Steward and Wash 1978).

In all cases, a consent form is presented to respondents before starting an interview (appendix III). The consent form specifies the research objectives and clarifies how the information generated from the interviews would be used. Given the cross-cultural nature of these interviews, and the sensitive political situation in numerous countries in Central and Eastern Europe, interviews were not recorded on tape, but by taking notes of key phrases and major points of respondents' answers (Shiple and Wood 1996). Prior to the interviews, a system of abbreviation was developed to facilitate note taking. On occasion, after reviewing the notes, respondents were contacted to clarify ambiguities and uncertainties.

As with all research methods, there are numerous problems associated with focused interviews (Adams and Jay 1989). First, given the open-ended nature of questions, it is difficult to compare systematically respondents' answers (Singleton and Straits 1999). Second, by focusing on respondent's personal perceptions, interviews convey a respondent's biases (Patton 1990). Third, in order to constitute data, the respondents' answers need to be interpreted by the researcher. Accordingly, the information generated from interviews reflects a researcher's personal interpretation of the interviewees' answers (Yin 1994). Therefore, to support or refute these findings, the interview results were corroborated with another information source.

Concurrently with the interviews, official documents were collected in all government offices and research institutes visited. Besides providing a mechanism to cross-check findings from other sources, official documents provide key information to a researcher. In many sectors, especially in the policy field, official documents often constitute the most direct and recent secondary source of information (Patton 1990). However, given the inherent biases and inaccuracies associated with such publications, all documents must be evaluated on the basis of an author's credential, date of publication, and intended audience (Bourner 1996). The following chapter presents the results obtain from all three research methods.

## CHAPTER 4: RESULTS

The Black Sea is one of the most polluted inland sea in the world. Its water quality depends upon the actions of all states included in the Black Sea catchment, especially the Danube River basin countries. Over the last decade, the Danube and Black Sea countries developed joint institutions and initiated collective actions to assure the sustainable development of their shared water resources. Despite this progress, the rehabilitation and protection of the Black Sea will require that more resources be devoted to environmental protection throughout the region, and that Black Sea and Danube countries cooperate on a more comprehensive basis. This chapter provides the information necessary to understand the nature of institutional arrangements in the Black Sea Region. The first section presents the principal physical and socioeconomic features associated with integrated management of the Black Sea. Then, the chapter analyzes the role played by different actors involved in the Black Sea situation, defines the legal framework behind the institutional arrangements, and examines the policy instruments used to structure the regional cooperative process.

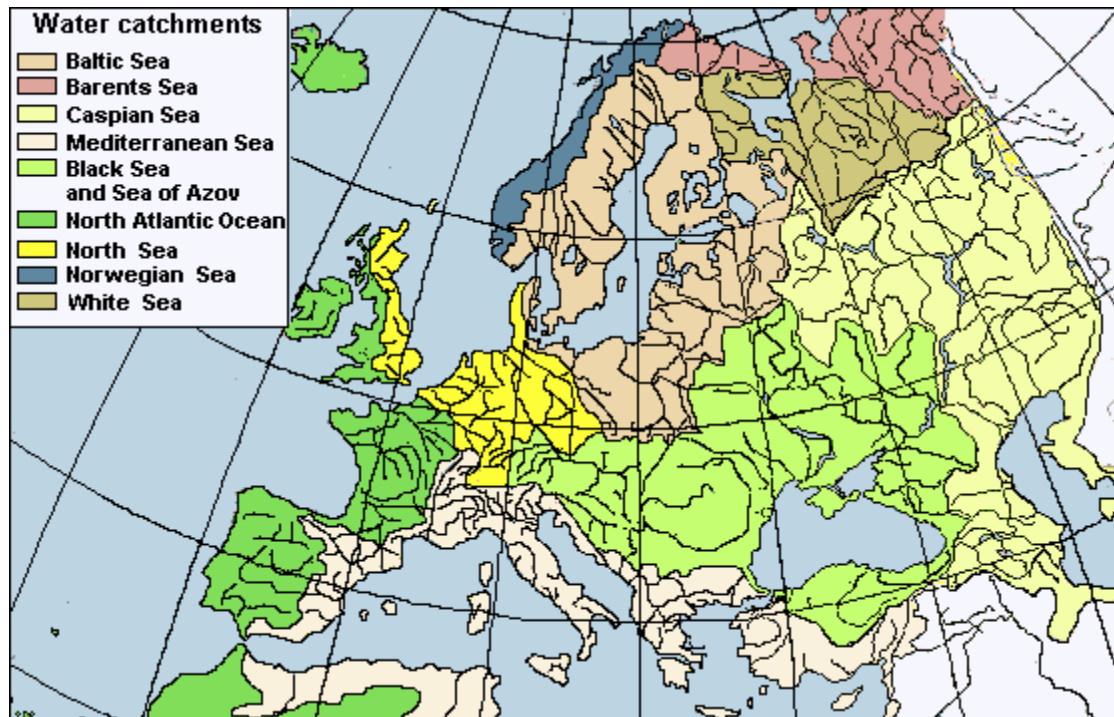
### **4.1 Context**

#### **4.1.1 Physical Attributes**

The present form of the Black Sea probably emerged about 40,000,000 years ago as structural upheavals in Asia Minor split off the Caspian Basin from the Mediterranean (Encyclopaedia Britannica 1982). Unlike the Baltic or North Seas, the Black Sea is virtually enclosed and connected only to the world ocean through the Bosphorus Strait (fig. 4.1). At the present rate of flow it would take about a thousand years to replenish the Black Sea with water from the Mediterranean (Mee 1999). Given this limited flushing capacity, the Black Sea is particularly sensitive to land-based pollution. About 350 cubic kilometers of river water pour into the Black Sea every year. The Black Sea receives the flows of Europe's second, third, and fourth largest river basins, respectively the Danube, Dnieper, and Don. Half of the Black Sea marine catchment area is covered by the Danube River Basin. Despite the intense utilization of the Danube, the river itself is not significantly polluted, due to its high flushing and dilution capacity (West 1999).

Although pollutant concentrations might be low, the total loads of pollutants are substantial. In addition to inorganic nutrients, thousands of kilotons of heavy metals, petroleum compounds, and chlorinated hydrocarbons are discharged each year in the Danube and its tributaries. Eventually, all pollutants enter the Black Sea.

**Figure 4.1 Europe's catchment areas**



Source: Crouzet *et al.* 1999

In a period of three decades, the Black Sea ecosystem suffered catastrophic degradation of its natural resources (Duda and La Roche 1997). Unsustainable economic activities and inadequate resource management practices resulted in deterioration of the Black Sea water quality and collapse of the Black Sea fish stocks (Mee 1999). Throughout the basin, the scientific community recognizes the phenomenon of eutrophication as one of the principal causes of the Black Sea degradation (ICPDR-ICPBS 1999). Eutrophication refers to the enrichment of a body of water by nutrients, usually compounds of nitrogen (N) and phosphorus (P) (Burt, Heathwaite, Trudgill 1993). When added to an aquatic environment, nutrients increase the density of phytoplankton communities. Although

some species may benefit from this enrichment, phytoplankton blooms exert stressful pressures on most species. Indeed, phytoplankton blooms reduce light penetration and increase oxygen demand from respiring and decaying phytoplankton (Hey and Mee 1993). In extreme cases, phytoplankton blooms can lead to the elimination of most higher benthic life forms. In the late 1960s, overenrichment of the Black Sea led to the formation of “dead zones” in the north western shelf, formerly the Black Sea’s most productive area (Crouzet *et al.* 1999).

As evidence of rapid eutrophication in the Black Sea, the Marine Hydrophysical Institute of Sevastopol recorded significant changes in water transparency throughout the water body (ICPDR-ICPBS 1999). In open sea, the primary reason for changes in transparency is determined by fluctuations in the density of phytoplankton in the water. Although there were major variations between estuarine areas and the open sea, the mean Secchi depth decreased by nearly 15 meters between 1971 and 1992.

Every year, nearly a thousand kilotons of nitrogen and a hundred kilotons of phosphorus are discharged into the Black Sea (BSEP 1996). About half of the nutrients released originate from agriculture, slightly more than one quarter from domestic sources, and the remainder from the industrial and mining sectors (Zessner and Kroiss 1999). The most important pathways are: direct discharges (33% of the total, predominantly from agriculture), erosion / runoff (31%, mainly from agriculture), and effluents from sewage treatment plants (30%) (Lampert and Brunner 1999). Based on pollution source inventories conducted for preparation of the Black Sea Transboundary Diagnostic Analysis (1996) and the Danube Transboundary Analysis Report (1999), researchers estimated that the Danube River accounts for well over half the nutrient input. Across the basin, emissions of nutrients are unevenly distributed among the Danube and Black Sea countries. It is estimated that Romania contributes nearly one third of the total nutrient loads discharged into the Black Sea, and about one quarter of the nutrient inputs to the Danube River (Phare 1997). Other important contributors include, Germany and Austria, which jointly release 26% of the nitrogen and 15% of the phosphorus. Although nutrient



loads significantly decreased during the last decade, it is expected that they will rise again with economic recovery (ICPDR-ICPBS 1999).

In a recent study by the World Bank, the short-term costs of the Black Sea degradation were estimated to exceed \$1 billion U.S. per year (Mee 1993). This study accounted for losses in the fishing and tourism sectors, and the cost of increased public health risks. In the fishery sector, eutrophication, in conjunction with over-fishing, contribute to the decline of the fish stock, decrease of the catch value, loss of employment, and immobilization of fishing vessels (Knowler, Strand, and Barbier 1997). Nearly 150,000 people depend directly on the Black Sea fisheries for their livelihood. In the tourism sector, losses occurred as hundreds of contaminated beaches were forced to close for sanitary reasons (Mee 1993). Although in most cases these closures were temporary, in some instance the detection of waterborne cholera necessitated more drastic measures. As the Black Sea water quality deteriorates, tourists are switching to other littoral destinations such as the Mediterranean coast. In 1995, a survey conducted among Romanian tourists, concluded that a 20% decrease in water quality would be associated with a 44% decrease in the number of tourists visiting the Romanian Black Sea coast (World Bank 2000). Unless cost-effective environmental protection measures are adopted throughout the basin, the Black Sea will continue to deteriorate.

#### **4.1.2 Attributes of the Community**

The Black Sea is one of the most international marine catchment basins in the world (Mee and Topping 1997). Its catchment includes major parts of sixteen countries: Austria, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Federal Republic of Yugoslavia, Georgia, Germany, Hungary, Moldova, Slovakia, Slovenia, Romania, Russia, Turkey, and Ukraine. The basin population is about 160 million people, which represents twice the population in the Baltic Sea (Hey and Mee 1993). Economically, there are profound differences among the economic development level of the countries of the Black Sea catchment. As noted in the Danube Regional Project (2001), the analysis of economic disparities indicates a clear west east trend showing a decline in the country's economic status. Within the catchment, gross domestic product (GDP) varies from \$1,818 billion

U.S. in Germany to \$6.4 billion U.S. in Bosnia-Herzegovina (table 4.1). In 1999, the German's and Austrian's national per capita income (NPCI) exceeded \$22,000 U.S. In Bosnia-Herzegovina, Bulgaria, Federal Republic of Yugoslavia, Georgia, Moldova, and Ukraine the NPCI is below \$5,000 U.S. Disparities between the countries can also be observed in terms of the country-specific composition of the GDP by main economic sectors. In the Danube River basin, the share of the agricultural sector ranges from 2.1% in Germany to more than 34% in Romania.

**Table 4.1 Economic profile in Danube and Black Sea countries (1998)**

<b>COUNTRY</b>	<b>GDP</b> (\$ billion US)	<b>GDP per capita</b> (\$ U.S.)	<b>Agriculture</b> (%)	<b>Industry</b> (%)	<b>Services</b> (%)
Austria	187.10	23,166	2.1	27.6	70.3
Bosnia-Herzegovina	6.40	1,720	N/a	N/a	N/a
Bulgaria	39.71	4,809	11.7	28.3	60.0
Croatia	30.38	6,749	10.3	20.3	69.4
Czech Republic	127.27	12,362	5.0	33.8	61.2
Georgia	18.245	3,353	N/a	N/a	N/a
Germany	1,818.9	22,169	1.1	33.9	67.0
Hungary	103.49	10,232	3.0	30.3	66.7
Moldova	8.37	1,947	30.0	25.0	45.0
Romania	127.08	5,648	34.2	19.1	46.7
Russia	947.68	6,460	N/a	N/a	N/a
Slovakia	52.29	9,699	5.3	27.0	67.7
Slovenia	28.33	14,293	5.2	36.1	58.7
Turkey	407.79	6,422	N/a	N/a	N/a
Ukraine	160.65	3,194	17.8	44.8	37.4
Yugoslavia	25.40	2,300	19.9	37.8	42.3

Source: Cordelier 2000

With the exception of Germany, Austria, and to a lesser extent Turkey, all countries within the Black Sea catchment are going through a profound period of transition initiated by the dissolution of the Soviet Union in 1991. Following collapse of the communist system, most newly independent states (NIS) launched economic and political reforms to transform their systems to parallel the western free-market and democracy model (Klarer and Moldan 1997). Fundamentally, this transition implies reorientation of property rights, decentralization of political processes, and liberalization of trade (Van Brabant 1999). While there is still much hope for improved economic performance in the long

run, all the effects of the transition have not been positive. In all countries, the transition was marked by important declines in output, high unemployment, and strong inflation. In numerous Central and Eastern European countries, dissatisfaction led to the democratic return of communists (Cordellier *et al.* 2000). Although the Czech Republic, Croatia, Hungary, Slovakia, and Slovenia basically rejected their political former systems, most countries in the region still retain structures from communism and central planning (Klarer and Moldan 1997).

For a majority of the NIS, the break up of the Soviet system provided the opportunity to renew their economic and political ties with Europe (Smith 2000). Throughout Central and Eastern Europe (CEE), the accession to the European Union (EU) has become a top priority. Besides marking their departure from the Soviet sphere, a successful accession to the EU would mean that the new members would be eligible to increased financial assistance, and more importantly benefit from open-access to the EU Single Market (Grabbe and Hughes 1998). For Germany and Austria, both members of the European Community, the eastward enlargement would contribute to stabilize the former communist region and facilitate economic trade between the two regions (Smith 2000). Among the EU members, Germany is one of the strongest supporters of enlargement. Indeed, each year, Germany accounts for more than 50% of EU exports to CEE countries (Grabbe and Hughes 1998).

The EU officially committed itself to the enlargement during the 1993 European Council held in Copenhagen. There, the Council established that countries would be allowed to become full EU members of the EU provided they satisfy specific economic and political criteria. As defined by the Council, the Copenhagen Criteria require: the establishment of a pluralist democracy with full respect for human rights and protection of minorities; the creation of a functioning market economy and the ability to cope with competitive pressures within the EU; the ability to undertake the full responsibilities of EU membership including the free circulation of goods and services, capital, and labour; and adherence to the aims of political, economic, and monetary union (Katz 2000). At this

stage, none of the applicant countries has met all these conditions (European Commission 1997).

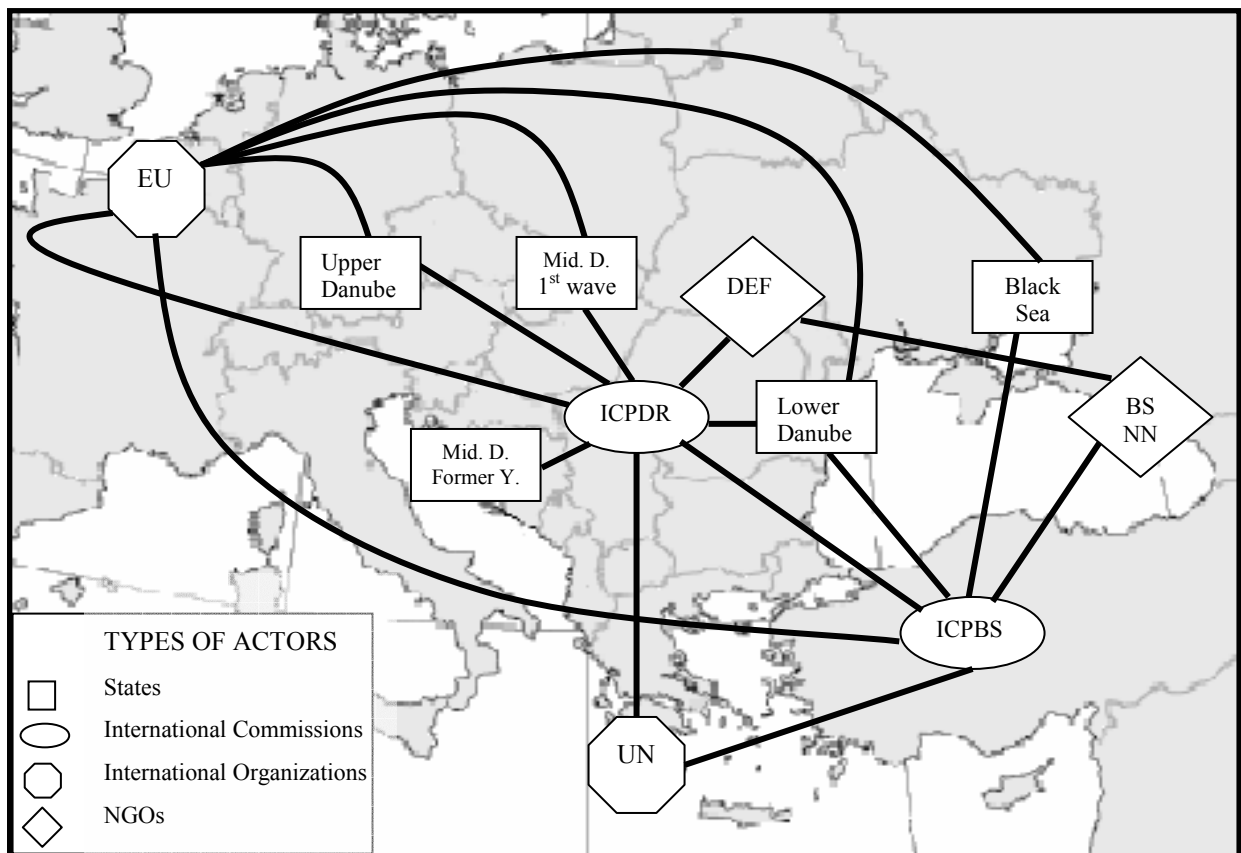
Based on the applicants' capacity to take on the obligation of membership, the European Commission (EC) divided all candidates into two groups, referred to as first wave and second wave candidates (Smith 2000). Within the Black Sea catchment, the first group is constituted by the Czech Republic, Hungary, and Slovenia. The second group comprises Bulgaria, Romania, and Slovakia. On December 2000, after 13 years of negotiations, the EC granted status to Turkey as an EU candidate. Despite this official recognition, Turkey has been marginal in the European integration process, much like Russia, on the grounds that it does not meet the EU political criteria (The Economist 2000).

## **4.2 Decision Space**

### **4.2.1 Actors**

Responsibilities for the protection and rehabilitation of the Danube and the Black Sea can be divided among four types of actors: (i) states, (ii) international commissions, (iii) international organizations, and (iv) nongovernmental organizations (NGOs). The geographical distribution of the Danube and Black Sea actors is presented in figure 4.2. For analytical purposes, the Black Sea states are grouped into five categories based on the countries' position within the catchment and their status in the enlargement process. The role of the International Commission for the Protection of the Black Sea (ICPBS) and the International Commission of the Protection of the Danube River (ICPDR) were recognized as well. In regards to international bodies, the emphasis was put on organizations operating under the auspices of the European Union (EU), United Nations (UN), and World Bank (WB). Additionally, the analysis considered the role played by NGOs such as the Regional Environmental Center (REC), the Danube Environmental Forum (DEF), and the Black Sea NGO Network (BSNN).

**Figure 4.2 Geographical distribution and relations among actors involved in the Black Sea situation**



### **States**

Throughout the Black Sea catchment, the primary responsibilities for environmental and water management lies with the national governments (ICPDR 1999c). Apart from Austria and Germany, the administrative and legal jurisdiction of local and regional governments usually is quite restricted. In Central and Eastern Europe, the role of regional water authorities and inspectorates is often limited to operational functions such as monitoring and sanctioning (ICPDR 1999c). Even though all countries have established a Ministry of Environment over the last decade, the lead responsibility for water management rarely lies with the ministry itself, but rather with older ministries (ICPDR 1999a). Special matters including irrigation, hydro-electricity, waterway infrastructure, and bathing and drinking water are still largely invested in ministries of

agriculture, industry, transport, and health. Recent reorganization efforts to promote a more integrated approach to water management are often obstructed by interministerial conflicts over budget allocations (Klarer and Moldan 1997).

Beyond these common administrative problems, the water management situation in the Black Sea countries is extremely diverse and varies widely in terms of the states' priorities, and resources available to address water pollution issues. Based on the countries' positions in the Black Sea system, and the states' status in the accession negotiations, the Black Sea countries can be grouped into five categories: (i) Upper Danube and EU members, (ii) Middle Danube and first wave candidates, (iii) Middle Danube and former republics of Yugoslavia, (iv) Lower Danube and second wave candidates, and (v) Black Sea and EU applicants. Based on this taxonomy, the Black Sea countries can be characterized as follow:

*(i) Upper Danube and EU members*

Austria and Germany are located in the upper part of the Danube River basin and are EU members. Both countries have thus far achieved high standards of water pollution control (UNDP/GEF 2001b). Over the last decade, the German government invested over \$2.4 billion U.S. in water pollution reduction programs. Ever since its accession to the EU in 1994, Austria has invested an average of \$780 million U.S. per year to respond to EU water directives. Further investments of \$250 million U.S. for each country are foreseen for the next three years (ICPDR 2001). In spite of these investments, neither country meets the European emission nutrient standards (Crouzet *et al.* 1999). In the medium term, Germany is expected to fully implement all EU water directives. As a downstream country on the Rhine suffering from upstream pollution, Germany is a long time proponent of integrated water management (De Villeneuve and Corel 1998).

*(ii) Middle Danube and first wave candidates*

The Czech Republic, Hungary, Slovakia, and Slovenia are in the middle section of the Danube River basin and all are interested in joining the EU as soon as possible. Apart from Slovakia, which does not meet the EU political criteria, all countries within this group are considered priority candidates for accession (European Commission 1997). All

four countries have reached medium economic development levels and are in the process of integrating environmental protection with economic development. Given their middle position on the Danube, all four countries lie both upstream and downstream of some other country; thus they both benefit from, and pay the costs of, transboundary pollution. This group of countries attested early its interest in developing a basin approach to water management (ICPDR 1999b).

*(iii) Middle Danube and former republics of Yugoslavia*

Bosnia-Herzegovina, Croatia, and the Federal Republic of Yugoslavia (FRY) are also located in the middle region of the Danube River basin. While Croatia has overcome to a great extent the aftermaths of war, Bosnia-Herzegovina and FRY are still struggling to reorganize their political, administrative, and socioeconomic systems (Cordellier *et al.* 2000). In the latter two countries, environmental legislation has not progressed beyond the constitutional phase since 1994 (ICPDR 1999c). As stated by the United Nations Industrial Development Organization (UNIDO) for Croatia, the wars following the break up of FRY caused enormous ecological damage to the Danube environment (Milich and Varady 1999). In 1999, it was estimated that FRY was responsible for nearly 15% of the total nutrient discharges in the Danube and its tributaries (ICPDR 1999c). At this time, the Serb authorities have neither agreed to sign the *Danube River Protection Convention* nor joined ICPDR.

*(iv) Lower Danube and second wave candidates*

Bulgaria, Moldova, and Romania are in the lower region of the Danube River basin. Apart from Moldova, both Bulgaria and Romania are Black Sea countries that contribute to, and suffer from, degradation of the Black Sea ecosystem. In all three countries, the collapse of the Soviet Union prompted serious economic problems. Despite the severity of environmental problems in this region, the financial capacity for investment are extremely limited (Ministry of Waters, Forests, and Environmental Protection of Romania 1998). According to the Danube Strategic Action Plan (1999), the level of investment currently allocated for environmental protection in the lower region of the Danube Basin are insufficient to allow pollution reduction in either the short or medium term. As

potential EU accession countries, Bulgaria and Romania are expected to devote more resources to environmental protection in order to comply with the EU environmental standards and directives (European Commission 1997). Having important tourist destinations on the Black Sea Coast, both countries would benefit directly from the rehabilitation and protection of the Black Sea ecosystem (World Bank 2000).

*(v) Black Sea and EU applicants*

Aside from Ukraine whose western border drains into the Tisza River and the Danube Delta, Georgia, Russia and Turkey are strictly Black Sea coastal countries. Although, the European Commission accepted Turkey's candidacy in the late 1999, all four countries remain somewhat on the margin of the European integration process (The Economist 2001). In comparison with Turkey, the former Soviet Republics demonstrated limited interest in the protection and rehabilitation of the Black Sea. For Turkey, the collapse of the anchovy fisheries in the early 1990s had disastrous effects on the coastal communities (World Bank 2000). In spite of Turkey's interest in the protection of the Black Sea, Turkish authorities have limited power to negotiate nutrient reduction measures with the other Black Sea countries or upstream Danube nations (Bagis 1997). In fact, the collapse of the anchovy fisheries was in large part attributed to the Turks unsustainable fishing practices (Bayazit and Avcı 1997).

*International Commissions*

In the early 1990's, with the assistance of the EU and World Bank, the Black Sea and Danube countries established two environmental programs for protecting the Black Sea and the Danube as a pre-emptive measure to prevent water pollution from reaching catastrophic proportions (West 1999). Both the Black Sea Environmental Program (BSEP) and the Environmental Program for the Danube River Basin (EPDRB) were designed to improve water quality in the region and develop cooperation on regional water management. In the first phase of the programs, the Black Sea and Danube countries established the institutional framework for cooperation, identified the major sources of pollution, and designed strategies for their remediation (Duda and La Roche



1997). As a result, two international commissions were instituted to oversee implementation of the regional legal instruments and policy tools.

The International Commission for the Protection of the Danube River (ICPDR) came into operation in 1998, with the entry into force of the *Danube River Protection Convention* (DRPC). Out of the 13 countries eligible to join ICPDR, only Ukraine and FRY have not joined the commission (ICPDR 2000). Established to strengthen regional cooperation and set a common platform for integrated river basin management, ICPDR constitutes the main steering and decision-making body under DRPC (ICPDR 1999b). ICPDR is composed of a Permanent Secretariat and a Project Management Task Force (PMTF), which are responsible for coordinating technical and administrative support between the contracting parties, and developing financial mechanisms for projects with transboundary relevance. The commission also comprises six experts groups to strengthen cooperation between the Danube countries in fields such as emission control, monitoring, accidental pollution and river basin management (UNDP/GEF 2001b)

In December 2000, the International Commission for the Protection of the Black Sea (ICPBS) officially replaced the BSEP Program Implementation Unit (UNDP/GEF 2001a). Like ICPDR, ICPBS is responsible for implementing the Black Sea environmental convention, namely the *Convention for the Protection of the Black Sea Against Pollution* (1992). As stated in the convention, the commission's Permanent Secretariat assumes the responsibilities for coordinating implementation of the Black Sea Strategic Action Plan, operating and maintaining the electronic communication system, seeking the technical and financial support from International financing agencies, and managing the six regional activity centers (RAC) (BSEP 1996). The RACs were created to provide the commission with information on the key topics related to the protection of the Black Sea, including the safety aspects of shipping, pollution monitoring, integrated coastal management, land-based pollution sources, and biodiversity.

Aware that the protection of the Black Sea can only be assured through regional cooperation, ICPDR and ICPBS created an ad-hoc technical working group to analyze the causes and effects of Black Sea eutrophication (UNDP/GEF 2001b). The working group concluded that the Danube accounts for well over half of nutrient inputs to the Black Sea and that, in line with the expected economic recovery, nutrient discharges were likely to rise again. In a memorandum of understanding (1999), the two parties committed themselves to restore the Black Sea ecosystem to conditions similar to those of the 1960's and in the meantime prevent nutrient discharges from exceeding 1997 levels (ICPDR-ICPBS 1999). To achieve these goals, the working group proposed a series of low-cost measures to reform agricultural practices, improve wastewater treatment, and rehabilitate wetlands.

### *International Organizations*

Since the establishment of BSEP and EPDRB, the main sources of assistance have been channeled through the World Bank's Global Environmental Facility (GEF), and the EU's Phare and Tacis programs. As a permanent financial mechanism, GEF builds upon a partnership between the United Nations Development Program (UNDP), the United Nations Environmental Program (UNEP), and the World Bank (UNDP/GEF 1999). As stated in its mandate, GEF was established to serve as a mechanism for international cooperation providing financial and technical assistance to developing countries to meet the incremental cost of measures for achieving global environmental benefits (Duda and La Roche 1997). In regards to international waters, GEF is responsible for catalyzing resources to implement more comprehensive and ecosystem-based approaches to the management of transboundary drainage basins. Within the framework of the UNDP/GEF Strategic Partnership, the World Bank proposed two nutrient reduction projects for the Black Sea and Danube in March 2001. In line with these projects, the World Bank will directly leverage over \$280 million U.S. for complementing the activities of ICPBS and ICPDR (World Bank 2000).

Since the collapse of the Soviet Union, the EU channeled most of its external assistance to the newly independent states through the Phare Program for the accession countries

and the Tacis Program for the transition countries. Given the scope of environmental degradation throughout the former Soviet block, both programs pay particular attention to environmental protection (Klarer and Moldan 1997). For EU members, the enlargement of the union is desirable only if candidates can meet all the EU environmental standards. Unequal standards between members and candidates would distort competition and eventually lead to the migration of economic activities to locations with lower environmental norms (Grabbe and Huges 1998). In the next seven years, the EU is expected to invest over \$12 billion U.S for assisting accession countries to improve environmental management (ICPDR 2000). About half of the EU external assistance is earmarked for nonstructural measures such as strengthening legislation and institutional mechanisms for environmental protection (Smith *et al.* 1999).

### *Nongovernmental Organizations*

On the eve of the political breakthrough in 1989, environmental groups constituted the only movement tolerated by the communists (Klarer and Moldan 1997). During this period, environmental movements were used by the public as a platform for showing the Soviets' economic and political failures. Although public interest in environmental issues decreased as the transition brought new social and economic problems, environmental NGOs are increasingly being integrated to the institutional system in the Black Sea Region (EEA 1999). Indeed, several organizations such as the Regional Environmental Centre (REC), the Danube Environmental Forum (DEF), and the Black Sea NGO Network (BSNN) were given observer status within ICPDR and ICPBS (Lang 2000). REC was established in 1990 to promote public participation, support the free exchange of information, and encourage cooperation among NGO's, governments, and business. Based in Hungary, REC opened country offices in 15 countries in Central and Eastern Europe. DEF, created in 1999, regroups NGOs from thirteen countries and ensures the participation of NGOs in the Danube main institutes, notably the ICPDR. Similarly, BSNN was established by the coastal countries to put pressure on governments to implement the National Strategic Action Plans for the protection of the Black Sea. Given the scarcity of resources available nationally for environmental protection, most of these NGOs rely on external sources to finance their activities (Lang 2000).

### 4.2.2 Legal Instruments

While countries acting individually can achieve much progress through domestic measures, ultimately resolution of transboundary water pollution requires international solutions to strengthen cooperation and coordination among local, national, and international actors (West 1999). In the Black Sea situation, the normative framework for water management and international cooperation is determined by (i) global water conventions, (ii) the *Convention for the Protection of the Black Sea Against Pollution*, (iii) the *Convention on Cooperation for the Protection and Sustainable use of the Danube River*, and (iv) the European Union *Acquis communautaire*. Although the degree of implementation of these international agreements varies among the sixteen Black Sea countries, in most cases these agreements have, to some extent, been transposed into the national legal systems as environmental or water acts.

#### *Global Water Conventions*

In the absence of a strong enforcing authority, international water law aims more at providing a general framework for cooperation rather than imposing precise quality and quantity standards (Le Marquand 1997). International water law defines general principles and customs that are expressed in treaties and conventions (Shmueli 1999). On rehabilitation and protection of the Black Sea, the most significant provisions are included in (i) the United Nations *Law of the Sea Convention* (1999), (ii) the *Ramsar Convention on Wetlands of International Importance* (1972), and (iii) the United Nations *Convention on the Law of the Non-navigational Uses of International Watercourses* (1998).

The UN Law of the Sea became legally binding on all parties on November 1994. This convention represents the first attempt to regulate in a comprehensive manner all the uses of seas. Unlike previous sea conventions, the UN law of the Sea places much importance on international cooperation to prevent marine pollution. As stated in the article 197 of the convention, “states bordering on enclosed or semi-enclosed seas should cooperate on a regional basis in elaborating international rules and procedures for the protection and

preservation of the marine environment” (1992). BSEP was instituted on the basis of this provision.

In line with the Ramsar Convention, most countries within the Black Sea catchment formulated management plans to promote conservation of wetlands of international importance on their territory. As Europe’s largest natural wetland, the Danube Delta was established in 1991 as a World Heritage Site and UNESCO Biosphere Reserve (ICPDR 1999b). Besides representing unique ecosystems, wetlands play an important role in the denitrification process (Burt, Heathwrite, and Trudgill 1993). Zessner and Kroiss (1999) estimated that wetlands and riparian zones along the Danube system absorb and retain about half of total loads of N and P discharged into the Danube basin.

Drawn under the auspices of the International Law Commission, the *Convention on the Law of the Non-navigational uses of International Watercourses* was adopted on May 1997 by the UN General Assembly. Among the Black Sea countries, only Turkey voted against the convention because it would limit its territorial sovereignty on the Tigris and Euphrates (Bagis 1997). Based on the concepts of “shared natural resources”, the convention’s main purpose is to prompt riparian and coastal countries to develop watercourse agreements to ensure the equitable and reasonable utilization of international watercourses. In the case that significant harm is caused, the states whose uses caused harm should take all appropriate measures to eliminate or mitigate negative effects of their activities (Shmueli 1999). Institutional arrangements in the Black Sea catchment give precedence to the doctrine of equitable utilization in order to avoid granting a veto to lower riparian or coastal countries (Utton 1996).

### ***Bucharest Convention***

Inspired by the UN *Law of the Sea Convention*, the *Convention on the Protection of the Black Sea Against Pollution* (1992) established the legal framework for cooperation among the states the most directly affected by the Black Sea degradation. Signed in Bucharest in 1992, the convention was ratified by the six coastal countries by April 1994. The “Bucharest Convention” addresses three main issues associated with the degradation

of the Black Sea, namely the control of land-based pollution sources, dumping of wastes, and joint actions in case of accidents. Provisions for the protection of the Black Sea against eutrophication are included in the convention's *Protocol on the Protection of the Black Sea Marine Environment Against Pollution from Land-based Sources* (BSEP 1997). According to this protocol, "contracting parties should take all necessary measures to reduce and, whenever possible, to eliminate pollution of the marine environment from land-based sources by noxious substances" (1992). Since nutrients are considered "more readily rendered harmless by natural processes" (1992), inorganic phosphorus and nitrogen are not listed as hazardous substances under the convention, but rather as noxious substances. For these compounds, the convention requires that contracting parties define levels, sources, and effects of these substances on the Black Sea ecosystem (BSEP 1996). Taking into account that noncoastal countries also contribute to the Black Sea pollution, the convention provides that contracting parties should develop cooperation with Danube countries to protect the sea from land-based pollution sources. As recalled in the convention, under the *Charter of Paris for a New Europe* (1990), all countries have an obligation to protect and preserve the European marine environment.

Following signature of the Bucharest Convention, Ministers of the Environment of the six coastal countries adopted the *Odessa Declaration* in April 1993. This ministerial declaration on protection of the Black Sea defines the goals, priorities, and timeframes needed to bring about environmental action in the region (UNDP/GEF 2001a). Among the priorities provided by the *Odessa Declaration*, coastal countries decided to adopt common environmental quality objectives and develop national plans for reduction of nutrients (Hey and Mee 1993). From a procedural perspective, the declaration marks the point of departure for the development of comprehensive environmental policies to protect the Black Sea against pollution. As trust and knowledge develop among Black Sea stakeholders, the scope of the declaration should expand to address increasingly complex problems and include noncoastal states.

### ***Danube River Protection Convention***

The *Convention on Cooperation for the Protection and Sustainable Use of the Danube River*, hereinafter referred to as the Danube River Protection Convention (DRPC), entered into force on October 22, 1998. Based on the Economic Commission for Europe's (ECE) *Convention for the Protection and Use of Transboundary Watercourses and International Lakes* (1992), DRPC provides the legal basis for cooperation among eleven of the Danube River basin countries (ICPDR 2001). As the ECE Convention, DRPC prompts application of the precautionary and polluter-pays principles, and supports adoption of the concepts of equitable and reasonable utilization of shared natural resources. Directed at basin-wide cooperation, DRPC focuses on prevention, reduction, and control of transboundary pollution. Although the convention provides for joint actions, the implementation of measures mainly lies with executive tools at the national level (ICPDR 1999b).

To address the Black Sea countries concerns related to eutrophication, DRPC provides that contracting parties should set emission limits based on best-available technologies for reducing concentrations of hazardous substances (2000). Both inorganic nitrogen and phosphorous compounds were included in the priority group of hazardous substances. Contracting parties should also adopt legal provisions for reducing inputs of nutrients from nonpoint sources, especially for the application of fertilizers in agriculture (Shmueli 1999). Progress made by the contracting parties will be assessed by ICPDR on the basis of periodical progress reports produced by each country. For analytical purposes, the convention requires that the eleven signatories harmonize their monitoring and assessment methods and implement joint monitoring programs to assess the Danube environmental condition. (ICPDR 1999a)

### ***Acquis Communautaire***

A basic principle for the accession of new members to the EU is that they adopt the totality of the Community *acquis*. The *acquis communautaire* represents the body of law to which all EU member states must adhere (Commission Européenne 2000). As described in the *Treaty of Amsterdam* (1999), the *acquis communautaire* consists of:

- The content, principle, and political objectives of the treaty
- legislation adopted pursuant to the treaty
- statements and resolutions adopted within the union framework
- international agreements concluded by the Community

In its last series of Regular Reports, the European Commission concluded that only Hungary and Poland could be in a position to adopt key elements of the *acquis communautaire* (European Commission 1999). As for previous enlargements, the European Council rejected the idea of partial adoption of the *acquis*. In exceptional circumstances, temporary derogations, and transitional periods may be negotiated (Blöch 1999).

For facilitating the adoption of the *acquis* by applicant states, the *acquis* has been broken down in 31 chapters, one of them devoted to the environment (Commission Européenne 1999). The environmental component of the *acquis* comprises about 200 pieces of legislation. In regards to water management, the applicant states ought to implement the Council Directives concerning wastewater treatment, nitrates, and the new *Water Framework Directive* (ICPDR 2000). The *Urban Wastewater Treatment Directive* (ICPDR 2000) sets minimum standards for collection, treatment, and disposal of wastewater. The *Nitrate Directive* (91/676/EC) was designed to prevent pollution of water caused by the application and storage of inorganic fertilizers and manure on farmland. The directive requires that member states identify vulnerable areas, develop action programs governing application of fertilizers, and establish codes of good agricultural practices (Crouzet *et al.* 1999). Both Austria and Germany designated the whole of their territory as vulnerable areas. Aware of the piecemeal nature of EU water policy, the European Commission recommended in 1997 the adoption of a framework directive. The *Water Framework Directive* (200/60/EC) aims at creating a structure within which stakeholders can develop an integrated approach towards water management (Blöch 1999).



### *National Water Law*

Over the last decade, most Danube and Black Sea countries developed environmental and water policies reflecting each country's environmental problems and economic capacities to finance sustainable development. Apart from Bosnia-Herzegovina and FRY, all countries prepared a national environmental plan, or a similar document, to outline basic principles of government policy towards environmental protection (ICPDR 1999a). Despite the diversity of environmental problems in the region, most countries share similar values and principles relating to environmental protection. Planning measures should account for best available technologies, respect precautionary and polluter pays principles, and attempt reducing pollution at the source. In the medium-term, all countries aim to harmonize national legislation with international norms, improve institutional capacities, establish environmental management funds, and apply economic incentives (ICPDR 2001).

In Upper and Middle Danube countries, national water policies include provisions to reduce pollution from diffuse and point sources, and increase wetland rehabilitation and public participation (ICPDR 2000). For this priority group of candidates and EU members, establishing legislation and environmental standards in compliance with EU norms is mandatory. In Lower Danube countries, new water acts were recently ratified. Largely inspired on requirements and standards applied in the European community, Bulgaria's and Romania's water policies focus on increasing the efficiency of existing waste water treatment facilities (ICPDR 1999c). Also seeking accession, Turkey is in the process of amending its water law to achieve institutional reorganization for the rational management and protection of surface and groundwater resources (Bayazit and Avci 1997). Although less successful so far, a similar approach is being pursued in Russia and Ukraine. For all applicants and associated countries, the EU *Water Framework Directive* has become the guiding principle for protecting water resources (Blöch 1999).

### **4.2.3 Processes and Mechanisms**

Since the European Community, UNDP, and GEF supported the establishment of BSEP and EPDRB, the Danube and Black Sea countries developed a series of mechanisms and

processes to ensure the implementation of the Bucharest Convention and DRPC. First, the Danube and Black Sea countries each produced a transboundary analysis to identify causes and effects of land-based pollution sources on receiving waters and Black Sea ecosystems. Second, two regional strategic action plans were elaborated to set the policy plan and action program for the protection of the Black Sea and Danube. Third, the Danube countries prepared a pollution reduction program to assess priority projects and measures addressing major pollution problems. Finally, GEF recently proposed two regional projects to reinforce the capacity of participatory countries to implement the three aforementioned mechanisms.

### *Transboundary Diagnostic Analysis*

As part of the GEF process on international waters, countries seeking GEF assistance must produce a transboundary diagnostic analysis (TDA) to describe the nature of the problem and identify opportunities for its remediation (Duda and La Roche 1997).

Completed in June 1996, the Black Sea TDA presents major problems associated with the degradation of the Black Sea, their root causes, and areas where actions can be taken to resolve these problems (BSEP 1996). Based upon the work of a group of specialists cooperating through BSEP network, the TDA indicates that major problems relate to:

- the decline in Black Sea commercial fish stocks
- loss of habitats supporting biotic resources
- loss of endangered species and their genomes
- replacement of indigenous species with exotic species
- degradation of Black Sea landscapes
- unsanitary conditions on many beaches

TDA concludes that Black Sea degradation is in large part attributed to inadequate planning measures, poor legal frameworks, and ineffective financial mechanisms (UNDP/GEF 2001). TDA also supports the hypothesis that the Danube is responsible for well over half of total loads of nutrients discharged into the Black Sea (BSEP 1996). These findings were estimated by applying the World Health Organization's Rapid Assessment Technique presented in table 4.2.

**Table 4.2 Distribution of nitrogen and phosphorous loads among Black Sea coastal countries (1996)**

<b>SOURCES</b>	<b>Nitrogen (kt/y)</b>	<b>Phosphorus (kt/y)</b>
National		
Bulgaria	75.467	1.125
Georgia	1.585	0.435
Romania	45.373	0.528
Russia	13.491	1.037
Turkey	38.008	5.857
Ukraine	42.830	4.638
<b>Total (national)</b>	<b>216.754</b>	<b>13.620</b>
International		
Danube	345.660	25.440
Dnieper	11.180	3.970
Dniester	22.750	0.980
Don	7.048	3.386
Sea of Azov	43.900	3.100
<b>Total (international)</b>	<b>430.538</b>	<b>36.876</b>
<b>Total</b>	<b>647.292</b>	<b>50.496</b>

Source: BSEP 1997

Because of economic disparities among Danube countries, the elaboration of the Danube TDA extended over a period of six years (Duda and La Roche 1997). In 1999, ICPDR published the Danube Transboundary Analysis Report (TAR) integrating results compiled in national review reports prepared by all Danube countries. In line with GEF Operational Strategy, TAR presents the state of water resources in the Danube River basin and identifies sources and causes of pollution (UNDP/GEF 1999). The assessment of water quality was based on the application of the Danube Water Quality Model (DWQM), which accounts for both point sources and diffuse sources of pollution (ICPDR 1999c). The results presented in table 4.3, were derived from “Hot spot” emissions along the Danube and its tributaries, and national consumption of mineral fertilizers. As demonstrated in TAR, the direct causes of the Danube pollution stem from inadequate wastewater and solid waste management, ecologically unsustainable industrial and mining activities, and improper land management and agricultural practices (ICPDR 1999c). Ultimately, remediation of these problems will require structural and nonstructural interventions in municipal, industrial, and agricultural sectors.

**Table 4.3 Distribution of nitrogen and phosphorus loads among Danube countries (1997)**

COUNTRY	Nitrogen (kt/y)		Phosphorus (kt/y)	
	Point Source	Diffuse Source	Point Source	Diffuse Source
Germany	20	100	1.2	5.8
Austria	24	72	2.2	4.6
Czech Republic	13	19	2.6	0.8
Slovakia	14	40	3.0	2.6
Hungary	19	63	5.4	7.8
Slovenia	12	12	1.5	1.3
Croatia	8	27	1.4	2.7
Bosnia-Herzegovina	8	29	3.2	1.9
Yugoslavia	32	74	9.8	7.9
Romania	74	157	12.0	15.6
Bulgaria	18	16	3.6	2.5
Moldova	1	12	0.2	2.0
Ukraine	3	31	1.1	4.6
<b>Total</b>	<b>246</b>	<b>652</b>	<b>47.2</b>	<b>60.1</b>

*Source: ICPDR 1999c*

### **Strategic Action Plans**

The Strategic Action Plan for the rehabilitation and protection of the Black Sea (BS-SAP) was finalized and signed by all six coastal countries during the 1996 Istanbul Ministerial Conference (Mee 1999). Developed over a period of two years, BS-SAP provides a clear statement of priority issues to be addressed and actions required for addressing them (UNDP/GEF 2001a). By signing BS-SAP, the coastal countries engaged themselves in adopting policy measures to reduce pollution from land-based sources, improve living resource management, encourage sustainable development practices, and take steps to improve financing for environmental projects. The most significant feature of BS-SAP relates to its emphasis on applying integrated water resource management, enhancing protection status for sensitive coastal and marine habitats, and adopting economic instruments to regulate existing sources of pollution. Due to economic difficulties and delays associated with the establishment of the Black Sea Commission, the implementation of BS-SAP does not respect the intended deadlines (UNDP/GEF 2001a). However, during the 2001 Conference of the Parties, the coastal countries reiterated their commitment to oversee the implementation of BS-SAP.

Received by eleven Danube countries in 1994, the Strategic Action Plan for the Danube River Basin (D-SAP) was revised by ICPDR in 1999 (ICPDR 1999b). As with BS-SAP, D-SAP provides guidance on policies and strategies for pollution reduction and sustainable development of water resources (Linnerooth and Murcott 1996). D-SAP aims at reversing eutrophication in the Black Sea, improving water management and water quality throughout the Danube River basin, and restoring key wetlands (ICPDR 1999a). Proposed measures included in this document are directed towards three main sectors of intervention; (i) municipalities, (ii) industry and mining, and (iii) agriculture and land-use (ICPDR 1999b). In the municipal sector, the central objective is to improve wastewater treatment by extending and upgrading public sewer systems. In a first phase, the objective is to equip with sewage systems 90% of municipalities with population over 5000. Investments in the industrial sector should focus on introducing best available technologies and best environmental practices. If fully implemented, this measure could lead to reductions in discharges of organic and inorganic effluents of 30%. (ICPDR 1999a) Improvement of agriculture and land-use calls for implementation of wetland restoration programs and application of good agricultural practices. In May 2000, D-SAP was updated to integrate objectives and requirements derived from the EU/Water Framework Directive (ICPDR 2000).

### *Danube Pollution Reduction Program*

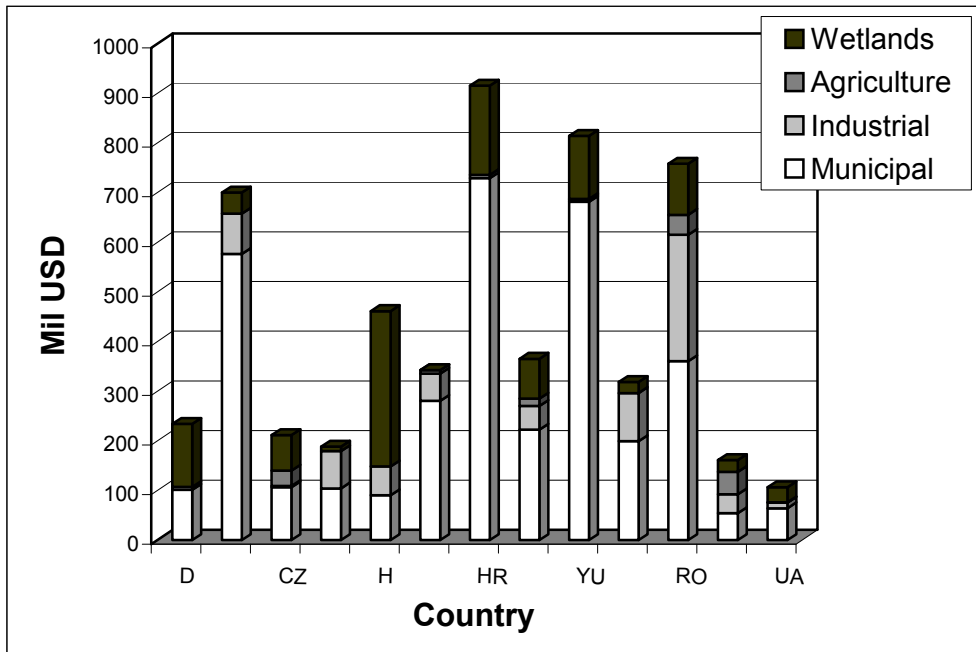
Given the scarcity of resources available for environmental protection in Central and Eastern Europe, it is essential that investments be directed towards projects achieving the most environmental benefits at the minimum costs (European Commission 1999). The Danube Pollution Reduction Program (DPRP) represents ICPDR investment plan to support implementation of the Danube SAP (ICPDR 2000). Developed on the basis of the projects presented in the national review reports, DPRP identifies a total of 421 projects to address water pollution issues in the Danube River basin (ICPDR 1999a). Total capital requirements for implementing these projects is of \$5.66 billion U.S, of which \$2.1 billion U.S. relate directly to nutrient removal. As illustrated in figure 4.3, a great portion of this sum is intended for projects in the municipal sector (63%). Out of the thirteen countries covered by DPRP, Austria, Croatia, FRY, Hungary, and Romania

will have to cover over 50% of total capital requirements (ICPDR 1999b). Key projects include the extension of wastewater treatment plants in the city of Bucharest, Belgrade, Budapest, Zagreb, and Sofia (ICPDR 1999a). The implementation of DPRP in its totality is expected to decrease nitrogen and phosphorus loads to the Black Sea by 14% and 27% respectively. In line with the polluter-pays principle, the long-term financing of most projects presented in DPRP will have to be financed within the countries themselves. In March 2001, about \$3.22 billion U.S. had been made available from national funding sources (UNDP/GEF 2001b).

### *GEF Regional Projects*

Fundamentally, eutrophication results from the failure of most sectors to understand the relationship between their activities and the degradation of remote aquatic ecosystems (Crouzet 1999). Thus, the improvement of water quality in the Black Sea is directly related to the implementation of non-structural measures to increase environmental awareness and improve institutional mechanisms for addressing environmental problems. Within the framework of the Danube / Black Sea strategic action plans, UNDP and GEF prepared two regional projects to initiate basin-wide capacity-building (World Bank 2000). Started in December 2001, these projects aim to create sustainable ecological conditions for land and water resource management throughout the Black Sea catchment (UNDP/GEF 2001b). Specifically, the Danube Regional Project was designed to strengthen ICPDR implementation capacities for nutrients reduction and assure a coherent approach to river basin management by assisting countries in the development of policy guidelines for applying integrated water resource management. The Black Sea project, formerly entitled “Control of Eutrophication, Hazardous Substances and Related Measures for Rehabilitating the Black Sea Ecosystem”, supports the full institutionalization of the Black Sea Commission (UNDP/GEF 2001a). The project will contribute to reinforce the institutional structure of ICPBS and revitalize the regional activity centers. Ultimately, a permanent mechanism for cooperation between the ICPDR and ICPBS will emerge from the completion of the two regional projects.

**Figure 4.3 Distribution of capital requirements among Danube countries**



Source: ICPDR 1999b

## CHAPTER 5: DISCUSSION

In a memorandum of understanding between ICPDR and ICPBS (1999), the Black Sea and Danube countries agreed to reduce nutrient discharges in the Black Sea to allow the recovery of the marine ecosystem to conditions similar to those observed in the 1960s. In order to achieve this objective, the two groups of countries elaborated management strategies and developed investment programs. At this stage, all sixteen countries are in the process of financing the required measures for the implementation of the strategic action plans. However, due to poor political support for environmental protection and the poor financial condition of governments in Central and Eastern Europe, the implementation of the nutrient reduction measures is far behind schedule (Klarer and Moldan 1997). Unless governments increase their supports for environmental protection, the Black Sea ecosystem will continue to deteriorate. This chapter provides the information to understand the prospects for change in the Black Sea catchment. It begins with an assessment of the institutional performance of the legal and policy instruments described in the previous chapter. This is followed by a discussion on the impacts of the enlargement of the EU on environmental protection in Central and Eastern Europe. The chapter concludes with an analysis of the principal challenges associated with the application of EU environmental policy in the applicant countries.

### **5.1 Institutional Performance**

The question that arises at this point in the analysis is whether the current institutional arrangements in the Black Sea catchment are likely to contribute to improve the health of the Black Sea ecosystem, and if so, at what costs? As described in chapter 3, applying the Institutional Analysis and Development (IAD) framework involves evaluating institutional performance in terms of the institutions' procedural capacities and anticipated outcomes. Processes are evaluated on the basis of transaction costs, and outcomes with respect to considerations of effectiveness, efficiency, and equity. Further elaboration on these techniques was provided in section 3.1.3.



### 5.1.1 Process Evaluation

Over the last decade, the countries of the Danube and the Black Sea have been engaged in a common enterprise to promote the sustainable development of water resources in Central and Eastern Europe. Despite the economic and political crisis, these countries achieved to develop joint institutions and processes to address common water quality problems. Among other things, these countries negotiated comprehensive water conventions, established international organizational structures, completed transboundary analysis, developed common strategies, and set-up joint monitoring programs. While very few abatements projects have been implemented at this stage, transaction costs associated with the planning and decision-making process were kept relatively low (table 5.1).

**Table 5.1 Institutional performance in the Black Sea catchment**

	<b>Strengths</b>	<b>Weaknesses</b>
<b>Process evaluation</b>		
Information costs	scientific research coordinated by BSEP and EPDRB	potential positive effects of eutrophication not considered
Coordination costs	negotiations extended over a short period	limited enforcing capacity of international commissions
Strategic costs	strong incentive to cooperate	capital requirements limited thus far
<b>Outcome evaluation</b>		
Effectiveness	operational basis for applying IWM established	limited effects on environmental quality
Efficiency	benefit-cost ranges between 1.23 and 1.76	improvement of water quality requires full implementation
Equity	cost sharing formula based on polluter pays principle	forces a large burden on poorer countries

#### *Information costs*

Institutional arrangements in the Black Sea catchment have proven to be effective in reducing information costs. In part, this can be attributed to the role played by the Black Sea Environmental Program (BSEP) and the Environmental Program for the Danube River Basin (EPDRB) in coordinating scientific research and keeping it focussed on

issues important to decision-makers. Over the years, BSEP and EPDRB mobilized thousands of experts and supported research in sectors ranging from wetland rehabilitation to coastal zone management (EEA 1999). Early in the process, an electronic communication system was established to facilitate communication between participants involved in the institutional network. It is through this system that the Romanian authorities informed downstream countries of the cyanide spill that occurred at Baia Mare on January 2000 (UNEP 2000). Perhaps the most significant information costs relate to errors resulting from incomplete information (Imperial 1999b). Most of the research conducted within the framework of BSEP and EPDRB assumes that reductions of nitrogen and phosphorus are desirable. Neither the Transboundary Diagnostic Analysis (TDA) nor the Transboundary Analysis Report (TAR) examines the relative importance of each nutrient on Black Sea eutrophication, or accounts for potential positive effects of eutrophication. Caddy (1990) indicates that small pelagic species such as anchovies can benefit from the increased productivity of the marine ecosystem.

### *Coordination costs*

As GEF reported in the regional projects, coordination costs related to the establishment of the International Commission for the Protection of the Black Sea (ICPBS) and the International Commission for the Protection of the Danube River (ICPDR) were consistent with the expected costs of negotiating regional agreements between a large group of sovereign actors (UNDP/GEF 2001a). In a period of less than a decade, the sixteen countries included in the Black Sea catchment agreed on adopting common water quality objectives and initiated collective actions to address water pollution issues of transboundary relevance. By comparison, the planning process that took place between the Rhine riparian countries and the North Sea coastal countries extended over a period of thirty years (De Villeneuve and Carel 1998). In the long term, coordination costs will depend on how water regulations and policies are monitored and enforced. Given the states' reluctance to sacrifice part of their sovereignty, it is unlikely that ICPBS or ICPDR will be granted further enforcement power. On enforcement, the role of the international commissions is limited to the monitoring of the polluters performance and the diffusion of information among the contracting parties. Within the frame of ICPDR, the progress

made by the contracting parties in implementing the Danube Strategic Action Plan (D-SAP) are assessed by an expert group on monitoring laboratory and information management (ICPDR 1999b). The Black Sea coastal countries also created an advisory group on pollution monitoring and assessment, but this has been less successful. Ever since its institution, this advisory group's financial situation has been reported as rather weak (UNDP/GEF 2001a).

### ***Strategic costs***

Strategic costs also appear relatively low. Apart from FRY and Bosnia-Herzegovina, all Danube and Black Sea countries participated and devoted resources to the planning process for improving water quality in the region. There are several explanations for this unanimous support. First, the context of political and economic transition offers a unique opportunity for CEE countries to address environmental issues in the process of establishing a new system (Klarer and Moldan 1997). Most of the institutions developed during this period came into an overall restructuring plan to reform the legal, institutional, and administrative frameworks of these former socialist countries. Second, the potential accession of CEE countries to the EU provides a strong incentive for governments in the region to integrate more deeply environmental protection with economic development (Sloccock 1999). As the European Commission stated in Copenhagen, all potential new members are expected to apply all components of the *acquis communautaire*, including the EU environmental policy (Smith 2000). Third, given the early stage of environmental cooperation among CEE countries, the Danube and Black Sea countries have been involved essentially in fact-finding processes (Duda and La Roche 1997). Such collaboration is less threatening to national sovereignty and does not require as much resources as structural projects. Strategic costs are likely to increase as countries are required to undertake expensive abatement projects.

### **5.1.2 Outcome Evaluation**

Thus far, the discussion of institutional performance has not addressed whether the institutional arrangements achieved their intended outcomes. While it is too early to assess the institutional performance in terms of physical results, the determination of the

institutions' success can be evaluated on the basis of their likelihood to achieve desired outcomes. As described in an earlier chapter, the IAD approach suggests evaluating anticipated outcomes with respect to considerations of effectiveness, efficiency, and equity. When viewed from these different perspectives, the overall performance of the Danube and Black Sea institutional arrangements turns up to be quite successful and tradeoffs between criteria appear relatively low.

### *Effectiveness*

In essence, the aims of BSEP and EPDRB were to improve water quality throughout the Black Sea catchment, and to develop regional water management cooperation (West 1999). While both programs proved successful in establishing an operational basis for integrated management in the Danube/Black Sea basin, their potential effects on the environment are still unknown. The nutrient reductions observed in recent years resulted more from the economic crisis that followed the collapse of the Soviet Union, than from pollution control measures (ICPDR-ICPBS 1999). The economic crisis forced the closure of many heavy industries and restricted severely the application of fertilizers by farmers. As stated in the previous chapter, the projects proposed in the Danube Pollution Reduction Program (DPRP) are expected to decrease the total loads of nutrients discharged in the Black Sea by 14% for N and 27% for P. However, because of the early stage of the process and the financial crisis affecting most CEE countries, it is unlikely that any significant reductions will occur before at least ten years (ICPDR 1999c). In the Lower Danube countries, the implementation of the priority projects is expected to extend over a period of 20 years. Generally, it is accepted that countries with high interest in EU membership will undertake the greatest efforts to implement DPRP (Grabbe and Hughes 1998).

Despite this absence of immediate effect on the environment, the current institutional arrangements attest to the Danube and Black Sea countries commitment to sustainable development and willingness to cooperate to control transboundary water pollution (Shmueli 1999). Through cooperation, this group of countries identified the levels and sources of pollution and defined strategies to ensure the integrated management of water

resources in the region. It is through such fact-finding collaboration that neighbouring nations develop the sense of trust necessary for the development of more stringent regional agreements (Linnerooth 1990). Applying integrated water resource management in international catchments does not represent a spontaneous strategy, but rather constitutes a gradual process involving sequential phases of development. At this stage, the Danube and Black Sea countries achieved rather successfully the first phases of cooperation. Less than ten years ago it would have appeared preposterous to expect those sixteen countries to work collaboratively on any issue (Duda and La Roche 1997).

### *Efficiency*

In term of efficiency, the institutional arrangements were evaluated with respect to the cost-effectiveness of the measures included in the Strategic Action Plans (SAPs). Assuming that the key projects identified in the Danube and Black Sea SAPs are fully implemented, the World Bank concluded that the investments proposed for the protection of the Black Sea against pollution from nutrients are justified in term of their cost-effectiveness (UNDP/GEF 2001b). The World Bank (2000) estimated that the benefit-cost ratio for a full investment program ranges between 1.23 and 1.76 . Spread over a period of twenty years, the implementation of the key projects to address eutrophication requires a capital investment of \$1.93 billion. The expected nutrient reduction to be achieved through this investment program would contribute to reduce fisheries losses, generate agricultural benefits, and avert losses in the tourism and health sectors. Half of the benefits are expected to occur in the tourism sector as the demand for Black Sea vacations increases with the improved water quality (World Bank 2000). In this sector, the present value of the quantified benefits would be of about \$1 billion. However, the study also concludes that only the full implementation of this investment program can lead to significant reduction in nutrient loads and economic benefits (World Bank 2000). Based on the current investment levels, the present measures to address eutrophication cannot compensate for the expected increase of nutrient discharges associated with the economic recovery. In order to be effective the SAPs have to be implemented as a whole.

## *Equity*

In the Black Sea catchment, considerations of fiscal equivalence transcend concerns for redistributive fairness. Established in the impetus of the 1992 Earth Summit, BSEP and EPDRB were both designed to respect the polluter pays principle (Duda and La Roche 1997). As demonstrated in DPRP (1999), the financial requirements for each country is proportionate to the country's contribution to the pollution problem (table 4.3 and figure 4.3). Austria, Croatia, Hungary, Romania, and Yugoslavia are expected to finance over half the total capital requirements for implementing ICPDR investment program. Since there are no "hot spots" on the German part of the Danube River basin, Germany was not included in this group of priority countries (ICPDR 1999a). Although Hungary and Romania would probably benefit more than other Danube countries from upstream pollution reductions, most of the projects proposed in DPRP are justifiable on a national basis. In Croatia and Yugoslavia the levels of investments required are justified to restore the Sava and Drava Rivers (Milich and Varady 1999). Both rivers lie entirely on Croatian and Yugoslavian territories and constitute the main drinking water supplies of the cities of Zagreb and Belgrade.

Despite DPRP strong emphasis on the polluter pays principle, some of the most prosperous countries involved in this process indicated their readiness to ease the burden of financing environmental protection in poorer countries. Though Austria and Germany already respect most provisions of the Danube SAP, both countries accepted to increase their investments to reduce nutrient discharges in the Black Sea (ICPDR 1999a). Similarly, Turkey continues to provide most of the resources necessary for the operation of the ICPBS (UNDP/GEF 2001a). Ultimately, the financing of the Danube and Black Sea regulatory programs will have to be met by the polluting countries themselves. In the event of the enlargement of the EU to include CEE countries, all new members will have to ensure that their environmental protection measures are consistent with those applied elsewhere in the Union. The European Single Market cannot function if distortions exist between members regarding environmental requirements (Smith *et al* 1999).

## **5.2 Prospects for Changes**

Over the last decades, Western societies came to recognize the necessity of protecting natural resources from depletion and pollution. In Europe, especially in the Northern states, environmental protection is now well integrated into social and economic development. In Central and Eastern Europe, the hard reality of the economic and political transition pushed environmental issues down the political agenda (Klarer and Moldan 1997). In most Danube and Black Sea countries, environmental protection is commonly perceived by the public as a drain of financial resources and an obstacle to economic development. Although legal and policy instruments were crafted to ensure the sustainable development of water resources in the region, in most cases these institutional arrangements still need to be implemented. Unless the pollution reduction measures identified during the planning process are fully implemented, the Danube and Black Sea ecosystems will continue to deteriorate.

According to many accounts, the remediation of environmental problems in the CEE region will depend on progress made in the economic sphere (e.g. European Commission 1997, Van Brandant 1999, Slocock 1999). Inspired by Ireland's astounding economic growth since its integration into the European Union, most CEE countries aspired to join the EU (The Economist 2001). However, in order to become full members, applicant countries are required to take on the obligations of membership, which entails implementing the EU environmental policy. As the enlargement moves forward, applicant countries are confronted with the necessity of integrating environmental protection and economic development. By linking environmental issues to the accession process, the EU provides a strong incentive for applicant countries to devote more resources to environmental protection. In this section, the discussion focuses on the implications of EU institutional arrangements on water management in the CEE countries. This section examines the role of the EU accession strategy and water policy.

### **5.2.1 Accession Strategy**

Aware of the structural changes required to liberalize and democratize CEE countries, and concerned by the negative impact that a premature integration would have on the EU,

the European Commission developed a pre-accession strategy to facilitate the applicants' integration into the EU. The primary objective of the pre-accession strategy is to structure the dialogue between members and applicants in order to identify both sides interests, priorities, and capacities towards the enlargement (Van Branbant 1999). Combining association negotiations with assistance programs, the pre-accession strategies focus on the applicants' adoption of the *acquis communautaire*. On the environment, the accession strategy defines the rules and norms that the applicant countries ought to implement prior to their integration to the EU (Sloccock 1999). Since the establishment of BSEP and EPDRB in the early 1990s, institutional arrangements for the Danube and Black Sea were crafted to respect the terms and conditions outlined in the accession strategy. Reflecting the EU's reliance on spill-over mechanisms, the enlargement strategy passes through four phases: (i) the establishment of Europe Agreements, (ii) the formulation of the White Paper, (iii) the elaboration of Accession Partnerships, and (iv) the opening of Accession Negotiations. From the beginning, the Phare Program channelled most of the technical and financial assistance provided by the EU to support the applicant countries in taking on the obligations of membership.

### *Europe Agreements*

The enlargement process formally started in 1991, when the EU contracted the first Europe Agreements with Poland and Hungary. Intended to prepare the way for the EU and its partners to converge economically, politically and socially, the Europe Agreements defined the main framework to prepare for membership (Klarer and Moldan 1997). Originally contracted to establish a free trade area between the EU and its associates, this set of agreements primarily focused on economic and trade issues (Smith 2000) The Europe Agreements also included a series of provision outlining the environmental actions necessary to support the liberalization of trade. For example, Hungary's Europe Agreement stated that special attention should be given to the harmonization of environmental standards, and that cooperation should be enhanced to solve cross-border pollution issues (European Commission 1997)



### *White Paper*

Formally defined as *Preparation of Associated Countries of Central and Eastern Europe for Integration into the Internal Market of the Union*, the White Paper provides the conditions to be met to allow the proper functioning of the EU Single Market (Van Brabant 1999). Basically, the White Paper contains a listing and description of all the legislation essential to the operation of the internal market, and describes the administrative and organizational structures necessary to ensure the effectiveness of the legislation's implementation and enforcement (Klarer and Moldan, 1997). The prioritization of the legislative pieces was based essentially on their contribution to the foundation of the EU internal market. All environmental legislation listed in the White Paper, essentially product-related environmental standards, were directly related to the functioning of the EU enlarged market (Sloccock 1999). Unequal environmental standards between members and applicants would distort competition, and eventually lead to the migration of economic activities to locations with lower environmental norms.

### *Accession Partnerships*

The Accession Partnerships were first completed in 1998 in response to the Agenda 2000 in which the European Commission presented an evaluation of each candidate based on the accession criteria defined during the Copenhagen Council in 1993 . With respect to environmental policy, the commission concluded that only Hungary and the Czech Republic are in the position of adopting the main part of the *acquis communautaire* in the medium term (Williams 2000). Consisting of short documents, the Accession Partnerships contain precise commitments on the part of the candidates with respect to the sectors identified as deficient by the Commission (European Commission, 1997). In partnership with the European Commission, each applicant must develop long term strategies for the effective implementation of the environmental *acquis*. The allocation of assistance funds is conditional on the progress made by the candidates in respect of the objectives identified in the partnership (Smith 2000).

### *Accession Negotiations*

As of 1999, the EU opened negotiations with twelve applicant countries. While the Europe Agreements, White Paper, and Accession Partnership respectively established the accession framework, legal structure, and enlargement program, the Accession Negotiations define the precise terms and conditions on which each applicant will join the EU. Since none of the applicants fully complies with the Copenhagen criteria, the Accession Negotiations ensure that the applicants implement and enforce the priority measures necessary for the extension of the Single Market, and determine the scope and duration of transition periods (Phinnemore 1999). Transition periods are granted on the basis of the complexity of the matters involved and the degree of legal and institutional preparation of the applicant (European Commission, 1997). Given the magnitude of environmental problems in the CEE countries, and the limited domestic resources available to solve these problems, the EU accepted that the applicants' alignment with the environmental component of the *acquis* could be realized according to a long term and gradual strategy. These transition periods only represent temporary extensions, not derogations. Although not all provisions inserted in the *acquis* require major investments and restructuring efforts, the European Commission stated that due to their relation with the operation of the Single Market, all applicants must comply with the directives on large combustion plants and wastewater treatment plants (Sloccock 1999). While the member states conceded that the application of these directives could be spread over a relatively long period, they are nonetheless mandatory.

### *Phare Program*

Aware of the costs and institutional reforms necessary to restructure the applicants' political and economic systems, the Commission attached a financial and technical instrument to the enlargement strategy. Set up in 1989 to support the economic and political transition in the newly independent states, the Phare Program constitutes the EU's main channel of financial and technical assistance. Since its creation, the program injected nearly \$10 billion U.S. in CEE countries (Smith 2000). Recently, the Commission narrowed the Phare's mandate to focus exclusively on the preparation of the applicants for membership (Klarer and Moldan, 1997). Ever since, the program has been

responsible for developing structures and human resources accountable for the implementation and enforcement of the new community legislation. Nearly 30% of the Phare funds are used to promote this institution building effort, which focuses on sectors such as finance, justice, agriculture and environment. In terms of environmental protection, the Phare's strategy consists of stimulating capital investment, initiating policy reforms, and promoting institutional development (Slococok 1999). While the long-term objective of the program is to promote sustainable development in CEE countries, the short-term objectives of the Phare are to resolve the most urgent environmental problems and harmonize the applicants' legislation with the *acquis communautaire* (Baumgartl 1997).

Since the collapse of the Soviet Union, the EU has become one of the most important actors in the Danube and Black Sea situation. Besides providing most of the financial and technical assistance to CEE countries, the EU is largely responsible for the institutionalization of environmental protection in the region. By linking environmental protection with prospects of economic growth, via the accession process, the EU has contributed to keeping environmental issues on the applicants' political agendas. Considering the severity of the economic crisis in CEE countries, it is doubtful that environmental issues would have been given as much importance if the restructuring process had been undertaken outside the EU framework.

### **5.2.2 EU Water Policy**

Thus far, the accession process has reinforced the position of environmental policy-makers within their governments. Ultimately, improvements in environmental quality will depend on how applicants and new members implement and enforce environmental legislation, but also on the substance itself of the EU environmental legislation. For most CEE countries, the collapse of the Soviet system revealed the trivial character of communist environmental legislation (Williams 2000). When such laws existed, they were incomplete, unenforceable, and in most cases, were instituted essentially to support the image of the system (Klarer and Moldan, 1997). Concerned with getting their economies back on track, the new governments devoted little resources to compensate for

this legislative and institutional deficit. Drawing upon the experience of Western European countries, CEE countries make up for this policy deficit through the adoption of legislation borrowed from the EU (ICPDR 1999c). In most CEE countries, especially in the Middle Danube countries, the EU water policy provides the main framework for water management.

Water policy is one of the oldest and most regulated issues in EU environmental policy. The development of common water policies dates back to the First Action Program on the Environment (1973), when member states identified water pollution as an issue requiring priority action (Holl 1995). From the start, member states recognized that water policy was a sector demanding that some actions be taken at the community level. Over the years, the Council ratified more than 20 directives dealing directly with water pollution, the most important being the *Drinking Water, Bathing Water, Dangerous Substances, and the Fish Directives* (Grant, Matthews, and Newell 2000). From the point of view of nutrients, the most significant EU directives include the *Urban Wastewater Treatment and Nitrate Directives*, and the recent *Water Framework Directive*.

Since water does not respect administrative and political boundaries, the EU intervention was justified to prevent conflicts between member states over transboundary pollution (Bloch 1999). Unlike other sectors, negotiations over water policy were facilitated by the fact that water supply and treatment facilities are largely publicly owned, therefore reducing conflicts between private interests (Grant, Matthews and Newell, 2000). In the aftermaths of the 1988 Frankfurt Ministerial Seminar, the Commission was put in charge of the revision of the EU water policy. Outdated, most water directives did not take into consideration the large improvements that had been realized in sectors such as water management and pollution control (Holl 1994). Moreover, the Commission decided to remedy the piecemeal approach to water policy, which sorted directives according to the form, use, or pollution source targeted. As a result of this revision, the Commission, on the basis of consultations with the Council and the Parliament, and the reception of submissions by Environmental NGOs and water supply companies, recommended that the council adopts a framework directive for water policy (Bloch 1999).

In spite of its recent entry into force, researchers and practitioners agree that the *Water Framework Directive* (WFD) represents a major step toward the sustainable management of water resources in Europe (Grant, Matthews, and Newell 2000). Designed to stimulate cooperation between decision makers and stakeholders of all sectors, WFD creates a structure within which responsible authorities of all levels develop an integrated approach towards water management. This legislation was given four objectives (Bloch 1999). First, based on ecological and chemical purity, member states must achieve by the end of 2015 a “good status” for all waters on their territory. As defined in Annex V of the directive, good ecological status implies that “the values of the biological quality elements for the surface body type show low levels of distortion resulting from human activity, but deviate only slightly from those normally associated with the surface water body under undisturbed conditions” (European Parliament 2000). Second, the scope of water protection must be expanded to cover all forms of waters, from groundwater to estuaries, and comprise all water uses. Third, water legislation needs to be streamlined, archaic directives must be repealed, and the remaining directives, the Drinking Water, Urban Wastewater Treatment Plant and Nitrate Directives, integrated with the new framework. Finally, water practices must be based on the concept of the river basin, the natural geographical and hydrological unit of water dynamics. The Directive will be implemented through the development of River Basin Management Plans defining the basin characteristics, reviewing the impact of human activities on the state of waters, and assessing the effects of existing legislation (ICPDR 1999c). The implementation of the Directive will fall within the responsibility of River Basin Management District established in each basin.

Despite the relatively weak legal nature of directives, WFD should generate favorable changes in water management practices in CEE countries. Indeed, the directive’s promotion of a river basin approach will surely contribute to increased cooperation between countries sharing the same river basin. Under article 3 of the directive (European Parliament 2000):

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. Where a

River Basin District extends beyond the territory of the Community, the member state or the member states concerned shall endeavor to establish appropriate coordination with the relevant non-member states, with the aim of achieving the objective of this Directive throughout the River Basin District.

On the Danube, such a provision has the potential to curtail power asymmetries between upstream and downstream countries, and stimulate cooperation between member and nonmember states. Furthermore, required to achieve a “good ecological status” for their waters, all member and applicant countries will have to reduce their emission of nutrients. The directive specifies that nutrient concentrations should not exceed the “levels established so as to ensure the functioning of the ecosystems” (European Parliament 2000). Central to this requirement will be the implementation of the directives concerning urban wastewater treatment (UWWT) and nitrates. The UWWT Directive sets emission limits for discharges of nutrients in sensitive areas subject to eutrophication. In these areas, nutrient removal is required for all treatment plants with a capacity of above 10,000 Population Equivalent (Crouzet *et al.* 1999). In the applicant countries, the final implementation of this directive is expected to be achieved in 10 to 20 years (ICPDR 2000). In the North Sea countries, the application of this directive has led to reductions of nutrient inputs from UWWT plants of up to 75% (Crouzet *et al.* 1999).

Aimed at reducing nutrient inputs from agriculture, the *Nitrate Directive* requires that member states establish action programs containing mandatory measures concerning application and storage of fertilizers in vulnerable areas (Crouzet *et al.* 1999). This directive also recommends that member states develop and implement codes of good agricultural practices. In Danube countries, good agricultural practices are expected to be applied in most large farms by the year 2005 (ICPDR 1999b). As stated in the Danube and Black Sea SAPs, reforms of agricultural policies offer the opportunity to reduce nutrient runoff through simple policy provisions, such as leaving strips of unploughed land near streams (ICPDR-ICPBS 1999).

In respect of the article 10 of the *Treaty of Amsterdam*, member states are under duty to take all measures necessary to ensure the fulfillment of obligations arising out of EU legislation (Union Européenne 1997). This provision applies to both directives and

regulations. Unlike regulations that are directly applicable, directives require formal adoption and integration into national law (Grant, Matthews and Newell, 2000). States are responsible for the implementation, practical application, and enforcement of all directives adopted by the Council. In the eventuality that a member state fails to implement or apply adequately a directive, the Commission has the right to bring the refractory member before the Court of Justice (Williams 2000). As the Commission is more inclined towards administrative settlements than judicial procedures, prior to resorting to the Court of Justice, it issues a reasoned opinion to specify the inadequacy of the member's actions. If the member continues to ignore the ruling, under article 228 the Court of Justice may impose financial penalties on member states (Union Européenne 1997). The level of the fine is proportionate to the seriousness of the infraction, and is adjusted using the state's gross domestic product (Grant, Matthews and Newell 2000).

In spite of the EU's enforcement regime, its legal system is based on solidarity, not coercion (Cole and Cole 1997). In fact, the functioning of the EU legal system relies on the members initial acceptance to comply with the EU legislation. Since EU legislation results from intergovernmental bargaining between member states, and requires either unanimity or a large majority, the EU's legislation reflects the interests of all members (Grant, Matthews, and Newell 2000). Common legislation has not been imposed on the members. Instead, it is the members who decide to develop regulations and directives to support their joint ventures. From this perspective, it is extremely important that the new applicant countries understand intrinsically and accept in its entirety the rights and obligations of membership; the efficiency of the EU's legal system depends on this initial recognition (Grabbe and Hughes 1998).

### **5.3 Challenges**

For Western and Eastern Societies, the collapse of the Soviet Union announced the end of the Cold War, and marked the return of Central and Eastern European countries to Europe. During the first years of transition, expectations ran high that the liberalization of the communist political and economic systems would bring about substantial benefits to all CEE countries (Smith 2000). Ten years after the dismantling of communism in CEE

countries, there has been much progress. Most governments are now democratically elected, market forces interact relatively freely, and environmental legislation has been enacted in several sectors. Nevertheless, the transition is far from being completed, and as the accession process moves forward, progresses become increasingly expensive and hard to achieve (The Economist 2001). The reality is that in most applicant countries, the governments' capacity to implement new legislation is still affected by structures and processes inherited from the communist system. Although the adoption of the EU institutional framework by the applicant countries constitutes the best available alternative to overcome this problem, the EU structure has its weaknesses, especially in the environmental sector. This section discusses the impacts of former communist structures on environmental protection, and examines the problems associated with the EU environmental policy.

### **5.3.1 Legacy of the Past**

Throughout the accession negotiations, CEE countries confirmed their adoption of the capitalist and democratic models. Although applicants can now draw upon the experience of Western states to restructure their economic and political systems, CEE countries are bounded in the short term by structures they inherited from the communists (Klarer and Moldan 1997). While the Czech Republic, Hungary, Slovakia, and Slovenia have overcome to a great extent the former central planning system, most countries in the region are still deeply rooted into communism and central planning (European Commission 1997). The Soviet legacy in former socialist countries is typically identified by four characteristics.

First, all CEE countries inherited of the Soviet industrial structure. Based on the socialist idea of substituting local intelligentsia and peasantry with heavy industrial workers, the communist system favoured the creation of large-scale heavy industries (Klarer and Moldan, 1997). Since the cost of rehabilitating the entire industrial sector is prohibitive, the former socialist countries have no other alternative than to use the existing industrial infrastructure to revive their economies (Grabbe and Hughes 1998). The states dependency on their inherited heavy industry is further stressed by the importance of the



sector as a major source of employment (Welfens 1999). In this period of crisis, politicians cannot justify the closing of industries for environmental or even public health concerns. Under the communist regime, job security was one of the governments' top priorities.

Second, the indebtedness of CEE states constitutes another obvious legacy of the past that constrains the states' actions today. In the mid-1970s and mid-1980s, several communist governments offered subsidies and created tax havens to earn hard currency without giving any consideration to efficiency and profitability criteria (Van Brabant, 1999). As a result, the new governments, especially those of Poland, Hungary, and Bulgaria, inherited colossal debts that considerably affect their capacity to deal with environmental problems. Compelled to devote all their available resources to earn hard currencies, the new governments have few resources left to develop restoration and protection programs (Klarer and Moldan 1997). Without resources, it is impossible for CEE states to implement the structural changes necessary to restore the environment.

Third, as a result of the communists' absolute control over the political and economic scene, former socialist countries are characterized by a lack of public participation in environmental planning and management (Lang 2000). In the environmental sector such disengagement is problematic, since the public usually constitutes the key supporters of environmental causes due to their close contact with the problem (Chiras 1994). Given that political mentalities change very slowly, especially when determined coercively, it will take more than a symbolic acceptance of the democratic model to truly transform popular attitudes.

Finally, the development of effective environmental policies is affected by the centralized nature of governments in post-Soviet states. Subjected to four decades of centralized and paternalistic planning, the new states inherited a system giving little consideration to local authorities (Baumgartl 1997). Despite the fact that decentralization is one of the fundamental tenets of democracy, the new central governments still preserve the majority of prerogatives (Lang, 2000). Originally, decentralization was attached to human rights.

Now that governments have implemented reforms that meet the needs of the population, decentralization is no longer a priority (Welfens 1999). As with other political and economic constraints inherited from communist institutions, this tradition of central planning inevitably affects the states' capacity to adopt sound environmental practices.

### **5.3.2 Weaknesses of EU Environmental Policy**

With the environment, a policy is considered effective when it achieves environmental improvement (Blomquist 1992). In order to achieve such a goal, a policy must pass successfully through all stages of the policy cycle, which involves the policy being conceived, drafted, adopted, implemented, applied, and enforced (Grant, Matthews, and Newell 2000). Ultimately, policy effectiveness is assessed in respect of the legislation's capacity to change the behaviours of the relevant actors, and not by the quality of the legislative output alone (Imperial 1999a). Due to the rigidity of the EU decision making process, and the weakness of its enforcement regime, the EU system reveals flaws in all stages of the policy cycle. It is doubtful that the accession of ten new members with defective legal and institutional system will improve the situation (Phinnemore 1999).

The EU decision making process relies on the interactions between three institutions: the Commission, the Council, and the Parliament (Commission Européenne 1999). In this triangular system, the Commission develops the policies, and the Council, after consultation with the Parliament, decides on the form of the policies to be adopted. From the start, the scope of EU environmental policies is impaired by the relatively weak power of the Environment Directorate within the Commission (Grant, Matthews, and Newell 2000). Even though the European Single Act gave explicit recognition to the intrinsic value of environmental protection, in practice, environmental issues are often reduced to their contribution to economic integration (Holl 1994). Obviously such subordination constrains the Environment Directorate's capacity to develop sound environmental policies. Furthermore, once the Commission elaborates a new policy project, it is submitted to the Council, which uses a qualified majority vote to decide the future of the policy. To be adopted, 71% of the ministers in the Council, and the majority of the member states must approve a policy (Commission Européenne 1999). Ensuring the

protection of each member's interests, intergovernmental negotiations within the Council constantly dilute the new policy proposed by the Commission (Williams 2000). As a result, environmental policies adopted by the Council are vague in terms of the obligations they put on the members, and often tend to represent the lowest common denominator (Phinnemore 1999). In the end, the effects that such provisions will have on the applicants are open to debate.

Moreover, out of the 200 environmental policies included in the *acquis communautaire*, 70% are directives (Sloccock 1999). Chosen for their flexibility and their respect of the member states' sovereignty, directives require the member to implement all measures necessary to bring national law in line with the EU policy. Unlike regulations that impose obligations of form, directives impose obligations with respect to the results to be achieved (Grant, Matthews and Newell, 2000). Accordingly, states have total control over how the directives will be implemented, applied, monitored, and enforced. Despite a procedure by which the Commission can bring before the Court of Justice delinquent member states, the EU's capacity to ensure the members compliance with the environmental directives is limited by its lack of monitoring mechanisms (Crouzet *et al* 1999). The Commission depends almost entirely on citizens and NGO complaints to assess the implementation and application of a directive (Lang 2000). As established during the Döbris conference on the environment, the mandate of the European Environment Agency, a suborgan of the Environment Directorate, is to manage and disseminate information provided by the national environment agencies, in any case will it independently seek to gather environmental data on the members' compliance with directives (Crouzet *et al.* 1999)

Considering the fiduciary nature of the Union's enforcement regime and the looseness of EU environmental policies, the effects that such policies will have on the applicant countries is uncertain (Williams 2000). Given the applicants' defective institutional systems, EU environment policy would probably be more effective if directives were limited in terms of their scope and systematically enforced by the Union (Grant, Matthews, and Newell 2000). As the analysis of institutional arrangements in the Black

Sea demonstrated, the main problem associated with environmental protection and resource management in the CEE countries lies with the implementation of legislations, not with the legislations themselves.

## CHAPTER 6: SUMMARY AND CONCLUSIONS

Applying integrated water management in international drainage basins proves to be extremely complex. In many cases, considerations of national sovereignty and concerns over distribution of payoffs between upstream and downstream countries present real obstacles to the implementation of integrated strategies. However, the experience to date suggests that cooperation problems can partly be overcome through the development of joint institutions. Through their effect on incentives, institutions can change patterns of interaction among participants involved in a common situation. Institutional arrangements, such as those established in the Black Sea catchment, provide opportunities for riparian and coastal countries to create neutral ground for building trust and arrange joint mechanisms for addressing common environmental problems. When offered proper incentives, states may be willing to relinquish part of their sovereignty for undertaking collective actions to improve regional welfare.

Unless institutional arrangements are well tailored to their context, it is unlikely that they will achieve intended outcomes. In this regard, the IAD framework represents a useful tool to assess the effectiveness of institutional arrangements and understand prospects for change. Despite the framework's original focus on local structures, the IAD approach proved useful to analyze institutional arrangements for integrated water management in international drainage basins. The purpose of the framework is to identify the sets of variables that are most likely to affect the actors' choices. The framework draws particular attention to rules and how they order relationships between participants, but also recognizes the importance of organizational structures and contextual attributes on patterns of interaction. Institutional arrangements are considered successful when they decrease transaction costs associated with the planning process, and achieve desired outcomes.

While a number of economic and political obstacles still prevent CEE countries from allocating resources necessary for ensuring sustainable development of water resources in the region, institutional arrangements for water management in the Black Sea catchment

have been strengthened considerably during the last ten years. Since the collapse of USSR, CEE countries have established an operational basis for integrated water management in the Danube/Black Sea basin. Nationally, most CEE countries have developed water regulations and policies, and created legal and administrative institutions to oversee their implementation. Regionally, Danube and Black Sea countries agreed to address common water pollution problems based on integrated management strategies and joint mechanisms. Recognizing their effect on Black Sea eutrophication, Danube countries committed themselves to reduce nutrients loads entering the Black Sea. In the long term, the improvement of water quality in the Black Sea catchment will depend on how and when measures included in the strategic action plans are implemented.

Since the signing of the first Europe Agreements, the EU has become a key player in the Black Sea situation. Through the accession process, the EU provided a framework for applicant countries to restructure their economic and political systems, but also supported the institutionalization of environmental protection in Central and Eastern Europe. Considering the seriousness of the economic crisis in CEE countries, it is unlikely that resource management would have been given as much importance if it had not been linked to the accession negotiations. The argument is that the accession process provides a strong incentive for applicant countries to devote more resources to environmental protection. In order to obtain the benefits associated with EU membership, applicant countries must adopt and apply the EU environmental policy. Although the EU has accepted that CEE countries could apply the environmental component of the *acquis communautaire* based on a long term and gradual strategy, the implementation of EU environmental directives is nonetheless mandatory. In member countries, directives such as the wastewater treatment plant and nitrates directives have contributed to reduced loads of nutrients discharged to the Baltic and North Sea.

While countries acting individually can achieve much progress, ultimately, remediation of transboundary problems requires international solutions. As the analysis of institutional arrangements in the Black Sea catchment has demonstrated, applying integrated water management in international drainage basins is time consuming and resource intensive.

However, as the tragedy of the Aral Sea reminds us, the cost of inaction is even greater. Given the critical state of the Black Sea ecosystem, it is important that CEE countries seize the opportunity offered by the transition and the accession process to establish new patterns of environmental management in the process of restructuring their political and economic systems. Unless governments increase their support for environmental protection, the Black Sea ecosystem will continue to deteriorate, perhaps beyond critical thresholds.

## APPENDIX I : RESPONDENTS

### Distribution of interviews

#### Geographical and sector by sector distribution

	Black Sea	Lower Danube	Middle Danube	Upper Danube
International Organisations	✓	✓	≠	✓
Governments	✓	✓	✓	✓
Research Institutes	≠	✓	✓	✓
Nongovernmental Organisations	✓	✓	✓	≠

### Interviews conducted

#### **Black Sea**

##### **Turkey:**

Dr. Radu Mihnea  
 Coordinator  
 Black Sea Environmental Programme

Ms. Sema Acar  
 Head of Department  
 Ministry of Environment, Department of international relations

Dr. Tanay Sidki Uyar  
 Chairman  
 Black Sea NGO Network

#### **Lower Danube**

##### **Bulgaria:**

Ms. Dafina Gercheva  
 Environmental Policy Specialist  
 United Nation Development Program

Dr. Nikolai Kouyumdzhev  
 Head of Department  
 Ministry of Environment and Water, Department of Water Protection

Dr. Atanas Santourdjian  
 Director  
 Bulgarian Academy of Sciences, Institute of Water Problem

Dr. Jordan Kosturkov  
 Research Fellow  
 Bulgarian Academy of Sciences, Institute of Water Problem



Dr. Ivanka Dimitrova  
Associate Professor  
Bulgarian Academy of Sciences, Institute of Water Problem

Dr. Lyubomir Stoyanov  
Director  
Emergency Response and Activity Centre

Dr. Christo Tanev  
Chief-Executive  
Research Institute of Shipping

Dr. Snejana Moncheva  
Coordinator  
Institute of Oceanology

Dr. Ivan Banchev  
Chairman  
Black Sea NGO Network, Regional Office

Ms. Gabrielle Jackson  
Volunteer  
US Peace Corp, BSNN

**Romania:**

Ms. Catiusa Tompos  
Scientific Director  
Environmental Protection Agency, Eastern Romania

Mr. Simion Lucian  
Head of Department  
County Council, Department of NGO Relations

Ms. Petruta Gugoasa  
Director  
Prefectura of Constanta

Dr. Alexandru  
Scientific Director  
National Institute for Marine Research and Development

Ms. Anca Tofan  
National Representative  
Regional Environmental Center for Central and Eastern Europe, National Office

Dr. Dan Manoleli  
Chairman  
Ecological Cooperation Group

Mr. Nicola Samrgiu  
Chairman  
Black Sea NGO Network, National Office

Ms. Laura Boicenco  
Technical Expert  
Black Sea NGO Network, National Office

Dr. Ionica Bucur  
Manager  
Information, Education and Resources Center for the Black Sea

Mr. David Sinclair  
Volunteer  
Voluntary Service Overseas, CIER  
Ms. Jennifer Rachels  
Volunteer  
US Peace Corp, Eco Counseling Centre  
Ms. Petruta Moisi  
President  
Danube Environmental Forum

### ***Middle Danube***

#### **Hungary:**

Ms. Olinka Gjigas  
Project-manager  
Regional Environmental Center for Central and Eastern Europe, Headquarter  
Dr. Maria Galambos  
Senior Expert  
Ministry for Environment & Regional Policy, Dept for International Relations  
Dr. Zsuzsa Steindl  
Water Expert  
Ministry for Environment & Regional Policy, Dept for International Relations  
Dr. Ferenc Laszlo  
Director  
Water Resource Research Center, Institute for Water Pollution Control  
Dr. Gyorgy Pinter  
Water Expert  
Water Resource Research Center, Institute for Water Pollution Control

### ***Upper Danube***

#### **Austria:**

Dr. Mihaela Popovici  
Technical Expert-Water Management and pollution Control  
UNDP/GEF  
Dr. Hellmut Fleckseder  
Technical Expert  
International Commission for the Protection of the Danube River  
Mr. Richard Stadler  
Head of Department  
Ministry of Environment, Department of International Waters  
Dr. Hellmut Kross  
Director  
Technical University of Vienna, Institute of Planning

## APPENDIX II: INTERVIEW GUIDE

**1.** One of the main problems associated with the management of transboundary watercourses is the result of the unidirectional nature of water pollution. How relevant is such an argument in the case of the Danube and to a wider extent the Black Sea Basin?

**a)** What actions are taken by your organization to remedy or diminish these asymmetries?

**b)** How are these actions contributing to the reduction of the Black Sea's eutrophication?

**2.** In 1998, the European Council officially launched the negotiation process with the Czech Republic, Hungary and Poland, and accepted the candidature of Bulgaria, Romania and Turkey. In your opinion, what are your country's main interests in acceding the European Union (EU)?

**a)** Although the enlargement of the EU offers advantages to both members and candidates, what are the drawbacks of this pan-European integration?

**b)** Do you think that for Central and Eastern European (CEE) countries the benefit of acceding to the EU outweighs the costs of integration? If so to what extent?

**c)** At the moment, what are the enlargement's principal challenges?

-What about the environment?

**d)** In term of environmental protection, how will the accession process affect water management in your country?

**e)** How, if at all, might this integration contribute to the reduction of water pollution in the Black Sea?

**f)** Do you approve that the enlargement of the EU could contribute to increasing cooperation over the management of the Danube? Why do you feel this way?

**g)** It is believed that the economic and political transition offers a "window of opportunity" for CEE countries to restructure their economies in more sustainable ways. How do you feel about this statement?

**3.** Among many criteria, it is often accepted that the successful management of transboundary resources necessitates the commitment of a group of states that are most particularly dedicated to the remediation of pollution. In order to lead the way, such states are willing to adopt environmental measures for which benefits will transcend their boundaries. How, if at all, might this generalization be applied to the Black Sea Basin?

- a)** As Danube riparian and Black Sea coastal countries could Bulgaria and Romania eventually play such leading function? Why do you feel this way?
- b)** How would you estimate Bulgaria and Romania's willingness and capacity to undertake such a mission?
- c)** What actions should be taken by these countries to confirm such a position?

**4.** Now, on a more general basis, how would you estimate the effectiveness of the current Black Sea institutional arrangements?

- a)** In your opinion, what should be done to improve this situation?
- b)** What role should your organization take in this collective effort?

## APPENDIX III: INTERVIEW CONSENT FORM

**Researcher:** Bertrand Meinier

**Department:** School of Resource and Environmental Management,  
Simon Fraser University, 8888 University Drive, Burnaby,  
British Columbia, Canada, V5A 1S6

**Contact Telephone:** Tel: (604) 430-5422  
Fax: (604) 291-4968

**E-mail:** [bmeinier@sfu.ca](mailto:bmeinier@sfu.ca)

The purpose of this form is to request your consent to participate in an interview related to your involvement in the management of the waters in the Black Sea Basin. This research is being carried out by a researcher at the School of Resource and Environmental Management at Simon Fraser University, and is possible thanks to Scholarships funded by the *Fonds pour la Formation de Chercheurs et l'Aide a la Recherche* (FCAR) and the *C. D. Nelson Memorial Graduate Scholarship*.

Information generated from the interview will be incorporated into a research project part of the requirements for a Master in Resource Management, which will be available at Simon Fraser University Library. The project will focus on the prospects for institutional changes in the Black Sea Basin. You may obtain copies of the result of this study, upon its completion, by contacting Bertrand Meinier at the above address and telephone numbers, or by e-mail.

**DO YOU / DO NOT** (*circle one*) require that the information provided in this interview be kept confidential. When citing information collected from you in this interview and any subsequent discussions, you wish to be referred to as (*check one*):

- identified by name. The researcher will contact you prior to quoting directly
- a representative of my organization, where the organization is named
- a respondent

The interview will take thirty minutes to an hour. Your participation is voluntary and you may terminate the interview at any time. Your signature below will serve as acknowledgement that you have received a copy of this consent form and have agreed to participate in this research under the terms outlined above. If you have any questions regarding the survey or research, please do not hesitate to contact: Dr. Peter Williams, Director of the School of Resource and Environmental Management at: School of Resource and Environmental Management, Simon Fraser University, Burnaby, British Columbia, Canada, Tel: (604) 291-3074, Fax: (604) 291-4968.

Subject consent: \_\_\_\_\_

Date: \_\_\_\_\_

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