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Transboundary River Basin Management in Europe

Bernard Barraqué and Erik Mostert

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E. Mostert and B. Barraqué

1 Introduction

At the World Summit on Sustainable Development in Johannesburg in 2002, the Millennium Development Goals were confirmed. These goals call for:

- the eradication of extreme poverty and hunger,
- universal primary education,
- gender equality and the empowerment of women,
- the reduction in child mortality,
- improvement in maternal health,
- combat of HIV / AIDS, malaria and other diseases,
- environmental sustainability,
- the development of a global partnership.

Most Millennium Development Goals are related to water. Goals such as food security and environmental sustainability require that water resources are protected effectively, that overexploitation is prevented and that appropriate water infrastructure is constructed and managed well. To a large extent, this is a governance issue. Skills and information need to be available, an appropriate legislative framework needs to be in place, decision-making processes should be fair, transparent and effective, and all stakeholders affected by or influencing water management should be involved.

The transboundary character of most water resources poses special problems. Worldwide more than 45 % of the land surface is located within international river basins and many groundwater aquifers are shared by more than one country (Wolf 1999). Unilateral action by one country concerning these resources is often ineffective (e.g. fish ladders in an upstream country only), inefficient (e.g. hydropower development in a flat downstream country) or simply impossible (many developments on boundary stretches). Moreover, unilateral action can significantly harm the other countries and may result in serious international tension.

Many people fear that the wars of the 21st century will be over water (cf. Wollebæk Toset, Gleditsch and Hegr 2000; cf. Swain 2000; cf. Trottier 2003b). There are however hardly any historical example of water wars (Wolf 1998), but conflicts falling short of a war have occurred frequently. For many international basins and aquifers no international agreement exists. For many other basins and aquifers, however, agreements do exist and effective institutions have been established that deliver benefits to all stakeholders. Complicating the picture further is that not every agreement contributes to the Millennium Development Goals. Some agreements only serve the interests of the national elites that pretend to represent their countries, while many agreements are based on the traditional water resources development paradigm that sees large-scale state-funded infrastructure works as the only way forward. A new water culture is needed that

considers water demand as well as water supply management, non-structural as well as structural and local as well as centralised solutions.
This paper will explore these issues. It first presents a general framework for describing and understanding the development of transboundary water management, based on Mostert (2005). Next, it reports about the experiences in Europe, focusing on the Rhine basin, with its long history of co-operation, the Danube basin, with its recent political changes, and the Iberian basins, with their water scarcity and ongoing discussions on a new water culture. In addition, the European Water Framework Directive (EC 2000/60) is discussed. The paper concludes with four recommendations.

2 Transboundary water management

Transboundary water resources management in Europe and elsewhere can be equated with the development and implementation of international "agreements" (treaties, gentlemen's agreements, etc.). In the end, what drives this process is not "objective" benefits of co-operation (see on these for instance Sadoff and Grey 2002; Klaphake 2005), but how the major stakeholders perceive these benefits. If in their eyes co-operation is a better alternative than non-co-operation, transboundary water management will progress. If not, it will stall.
Transboundary water management can be analysed as a cyclical process consisting of different stages (Figure 1). The first and often most difficult stage in transboundary water management is convening. It consists of bringing the major stakeholders around the table (Gray 1989). The stakeholders need to be convinced that:

(1) the present situation does not serve their interests optimally;
(2) negotiations could result in a fair agreement that could serve their interests better (Fisher and Ury 1981);
(3) the agreement will actually be complied with, also by the other parties to the agreement.

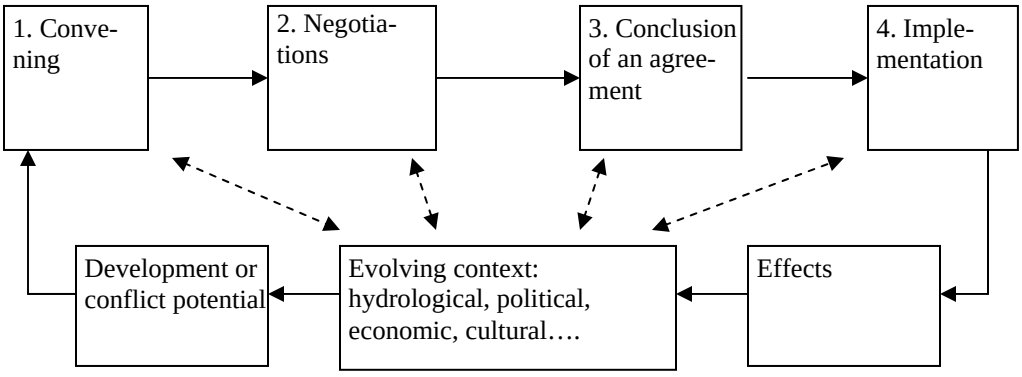

Figure 1: Stages in transboundary water management (Mostert 2005, p.6)

The second stage is the negotiations themselves (Gray 1989). If this has not yet been done at the convening stage, the agenda for the negotiations has to be decided upon and

some ground rules need to be agreed upon, for instance on confidentiality of the negotiations and on possibilities to exit. Moreover, the relevant "facts" have to be established, such as the natural river discharge, present use and projected demand, and several options need to be developed and assessed.
The third stage is the conclusion of an agreement. Experience shows that it may take between one and 100 years (the Alpine Rhine: Marty 2001) before this stage is reached. The most common and powerful factor contributing to the conclusion of agreements is the wish to develop or maintain good international relations (Mostert 2003; cf. LeMarquand 1977). Moreover, crises can act as important stimuli for co-operation (see below). Usually, agreements involve the establishment of some form of river basin organisation or coordination platform (Burchi and Spreij 2003).
As a rule, agreements need to be ratified or approved by a higher authority: a minister, the cabinet or parliament. This might prove difficult if the negotiators have not interacted effectively with these higher authorities. Problems may also occur after ratification or approval, when the agreement has to be implemented or complied with. Implementation or compliance is usually the responsibility of lower level government and water users who have not been involved in international negotiations.
This also points to the fact that transboundary water management is not a purely interstate affair. "States" are, in fact, abstractions. They are legal concepts and important symbols and provide a source of identity for many people, but in practice the main parties in transboundary water management are specific groups and individuals (Figure 2). These include groups and individuals that possess formal authority and other important resources for developing or implementing international agreements, such as money, political influence, information and expertise. They also include groups and individuals that may be affected by water management but are unable to exert any significant influence, such as the local population (cf. Trottier 2003a).

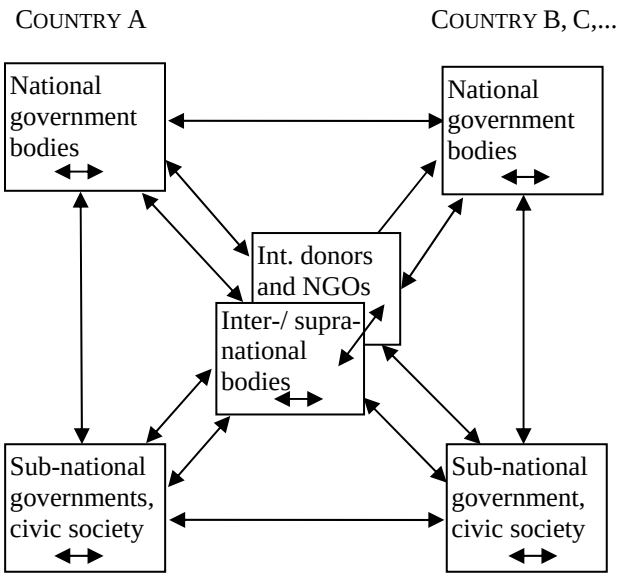

Figure 2: Relations in transboundary water management (Mostert 2005, p. 12)

Focusing exclusively on the interests and goals of the "states" means in practice focusing on the interests and goals of national governments. This may result in too little attention for the interests and needs of underprivileged stakeholders. For example, according to the policy of the government of Senegal, the international co-operation on the Senegal River is a success. Large dams have been built and irrigated agricultural land has increased. However, reportedly (Adams 2000) this proved to be at the expense of flood-recession farming, fisheries, the environment and the health of the local population. The dams on the Salween River in Myanmar provide another example. These could be seen as an example of effective international co-operation if one ignores the fact that Myanmar is using forced labour to construct them (Moe 2000; US Department of Labor 2000)

Transboundary co-operation is a necessary but not sufficient condition for effective management of transboundary resources. In addition, the co-operation should be inclusive and involve all important stakeholders, at national and at international levels. Moreover, the perceptions of the stakeholders that are involved and the dominant "water culture" more generally are crucial, as these determine what transboundary water management actually will look like and whether it contributes to the attainment of the millennium development goals or not.

3 The Rhine and the Danube

Rhine

The Rhine is the largest river in the north-west of Europe. Its basin includes major European industrial areas, such as the Ruhr-area in Germany and the Rijnmond area near Rotterdam. The river itself is used intensively for shipping, waste disposal (although point-source pollution has decreased significantly), drinking water production, industrial water supply and nature purposes.

Co-operation on the Rhine river has a very long history. Major progress has been achieved after major wars, other man-made and natural disasters and EU intervention. Co-operation started in the field of navigation. In 1815, just after the Napoleonic wars, the Final Act of the Congress of Vienna established the principle of freedom of navigation on international waterways. Moreover, a Central Commission for Rhine Navigation was created. This Commission, which still exists, consists of representatives from the member states Belgium, France, Germany, the Netherlands and Switzerland and has regulatory powers, for instance in the field of shipping safety. Infringements against the Convention for Rhine Navigation and regulations under this convention and certain civil matters, such as payments and dues for pilotage, can be brought against national Rhine tribunals. Appeal against their decisions is possible to a higher national court or to the court of appeal established by the Commission itself. (Act of Mannheim)

From 1900 onwards pollution with chlorides started to get attention. After the Second World War, growing awareness of this problem led to the establishment of the International Commission for the Protection of the Rhine (ICPR) in 1950. Initially, it dealt with research only, but since 1963 its task is to propose measures for protecting the Rhine against pollution. Members of the ICPR are Switzerland, Germany, France, Luxembourg, The Netherlands and, since 1976, the European Commission.

Chemical pollution got a lot of attention from 1971 onwards, when many fish died. Eventually, the negotiations on the Rhine's chemical pollution were linked with the

negotiations on the dangerous substances directive of the EU (76/464/EEC). The main reason was that Germany did not want to accept stricter environmental controls on its industry, which is located to a large extent along the Rhine, than on the industry in other EU member states outside of the Rhine basin (Jesserun d'Oliveira 1987).

On 3 December 1976, the “Convention for the Protection of the Rhine against Chemical Pollution” was concluded. Meanwhile agreement had been reached on the dangerous substances directive, which also regulated chemical pollution, but at the EU level, thus addressing Germany’s concerns about its own industry.

Also on 3 December 1976 the same day the “Convention on the Protection of the Rhine against Pollution by Chlorides” was concluded. This convention required France to reduce chlorides emissions by 60 kg/s before 1 January 1980, to be financed largely by the other basin states (Switzerland 6%, Germany 30% and The Netherlands 34%). The first stage would be a reduction by 20 kg/s. Further measures would depend on an agreement on the technique and financing (Dieperink 1997; 1999). The official argument for the financial contributions was that the French potassium mines were not the only source of chlorides pollution and that the French reductions would mean that the other basin countries did not have to reduce their emissions. But in practice, the French potassium mines are the single biggest source, and the financial contributions can be seen as a concession to France in order to get an agreement.

Implementation of the conventions turned out to be difficult. Due to protests in the Alsace region, the region of the potassium mines, the French government refused to submit the Chlorides Convention to parliament for ratification. Emission standards for chemicals were formulated for only four “black list substances”. It turned out that many black list substances did not occur in the Rhine basin in significant quantities, could not be detected, or came primarily from diffuse sources. Moreover, sometimes EU standards were considered more appropriate.

International co-operation got new impetus when, on 1 November 1986, a fire broke out at Sandoz AG near Basel. The water used for extinguishing the fire brought huge quantities of pesticides into the Rhine. Within two weeks, a Rhine Ministers Conference was organised, and in May 1987 a concept Rhine Action Plan was ready, which included as central goals the return of the Salmon in the Rhine and a 50% reduction of emissions for many substances (Dieperink 1997). According to the secretary of the ICPR at the time, co-operation was promoted quite a lot by the fact that immediately after the accident, the downstream countries did not blame Switzerland for the accident (which could have caused defensive behaviour on the part of Switzerland), but instead expressed their concern that of all countries the accident had to happen in Switzerland, with its good record in water management (P. Huisman, former secretary of the ICPR, personal communication).

The Netherlands gave the highest priority to the implementation of the Rhine Action Plan (ICPR 1987). This had repercussions on the negotiations concerning the further reduction of chloride emissions from minus 20 kg/s to minus 60 kg/s. Since The Netherlands would have to contribute financially, this would be very expensive for The Netherlands too. A compromise was reached in 1991. The Dutch drinking water companies made clear that they would have to make very high costs if chloride concentrations at their intake points would not go down. Moreover, it was found out that the concentrations could be brought down by changing the water infrastructure in the Netherlands, at a much lower cost than

further reductions in France. In the end, it was agreed to implement the local measures in The Netherlands and reduce the financial contribution of the Netherlands to France.
The present phase in the international Rhine co-operation started in 1994. Following the floods in late 1993, it was decided that the ICPR should be active in flood protection as well. Building on the good relations that had developed, despite occasional problems, in 1998 the Action Plan Flood Protection could be published (ICPR 1998). Furthermore, a new Rhine Treaty was signed on 12 April 1999 (ICPR 1999). Finally, as the Rhine Action Plan ended in the year 2000, the new programme "Rhine 2020; Program for the Sustainable Development of the Rhine" has been adopted on 29 January 2001 (Conference of Rhine Ministers 2001).
The ICPR is basically an inter-governmental commission for discussing Rhine-related matters. The decisions of the ICPR have the form of an advice to its member states (decisions on monitoring and research programmes excepted). Moreover, the member states have to report to the ICPR on the measures that they have taken for protecting the Rhine.
The ICPR consists of a Plenary Assembly and a president; three working groups, a co-ordination group and a secretariat headed by a secretary. The Plenary Assembly consists of delegations from the five participating countries and the EU and meets at least once a year. Decisions are taken by unanimity (with maximally one abstention). The working groups and project groups consist of national experts from the ICPR countries. The co-ordination group co-ordinates the work of the ICPR and prepares the decisions of the Plenary Assembly. It meets approximately four times per year. The ICPR is supported by its permanent secretariat, located in Koblenz (Germany).
Formally not part of the ICPR is the Ministers Conference, which consists of the pertinent ministers of the ICPR countries. The Ministers Conference meets on an ad-hoc basis and functions as the highest authority. Unlike the Plenary Assembly, the Ministers Conference can take (politically) binding decisions. The Minister Conference also adopted the Rhine Action Plan.
The public is in several ways involved in the work of the ICPR. Firstly, according to the new Rhine Treaty", the IRC has to exchange information with relevant NGOs, take their position into account when taking decisions, and inform the organisations about the decisions. For years already the ICPR has published and actively disseminated reports containing for instance monitoring results. Secondly, nineteen NGOs have obtained observer status inn the Commission. They can participate in the discussions in the Plenary Assembly, the working groups and the project groups; the co-ordination group is closed for NGOs. Finally, each member state is totally free to organise national preparatory meetings with NGOs or other forms of PP on Rhine issues (Enserink, Kamps and Mostert 2003; Kampa, Kranz and Hansen 2003; Garritsen, Vonk and de Vries 2000).

Danube

The history of the Danube and even its international character is inextricably linked to regional and geo-political developments. At the eve of the First World War, the major basin country was the Austro-Hungarian empire, but after the First World War it was split up and new countries were formed. In the aftermath of the Second World War, most of these countries became part of the Soviet Block and only Germany and Austria were part of the Western block. Following the fall of communism in 1989, Czechoslovakia,

Yugoslavia and the Soviet Union were split up, resulting in a total of eighteen basin countries, which makes the Danube basin the most international basin in the world (table). The most recent political change is the accession of several basin countries to the European Union.

	Share of basin (km^2)	Formerly…	EU member since…	Party to Danube Convention since…
Albania	126	Part of Ottoman empire (until 1912)	-	-
Austria	80,423	Austro-Hungarian Empire (until 1918)	1995	1994
Bosnia i Herzegovina	36,636	Ottoman Empire (until 1878) Austro-Hungarian Empire (until 1918) Yugoslavia (until 1992)	-	2004
Bulgaria	47,413	Ottoman Empire (until 1878)	2007	1994
Croatia	34,865	Austro-Hungarian Empire (until 1918) Yugoslavia (until 1991)	?	1994
Czech Republic	21,688	Austro-Hungarian Empire (until 1918) Czechoslovakia (until 1992)	2004	1994
Germany	56,184	Different German States (until 1871)	1951/56	1994
Hungary	93,030	Austro-Hungarian Empire (until 1918)	2004	1994
Italy	565	Danube part formerly Austrian	1951/56	-
Macedonia	109	Ottoman Empire (until 1913/19) Yugoslavia (until 1991))	-	-
Moldova	12,834	Russia/ Soviet Union (1812-1918, 1940-1941, 1947-1991) Romania (1918-1940, 1941-1947)	-	1994
Poland	430	Danube part Austrian until 1918	2004	-
Romania	232,193	Partly Ottoman Empire (until 1859) Partly Austro-Hungarian Empire (until 1918)	2007	1994
Serbia and Montenegro	88,635	Ottoman Empire (until 1829/ 1878) Yugoslavia (until 1991-1992)	-	2003
Slovak Republic	47,084	Austro-Hungarian Empire (until 1918) Czecoslovakia (until 1992)	2004	1994
Slovenia	16,422	Austro-Hungarian Empire (until 1918)	2004	1994
Switzerland	1,809	-	-	-
Ukraine	30,520	Russia/ Soviet Union (until 1991)	-	1994 (ratified 2002)

Table: Danube basin countries (ICPDR 2005; Brogan 1990, www.historyofnations.net)

As with the Rhine, international co-operation started in the field of navigation. In 1856, the Paris Treaty, which concluded the Crimean War, established the European Danube Commission. This treaty was complemented as a result of the Trianon Peace Treaty from 1919, which established the Permanent Technical Hydraulic System Commission of the Water regime. Detailed regulations had to be agreed upon bilaterally between the different new states. This system ensured for instance a faultless functioning of the water level and flood warning service, but it also had deficiencies in many respects and mainly served to maintain existing conditions (Bruhàcs 1993).
The 1947 peace treaties only contained provisions concerning the navigational uses of the Danube. The two former Danube Commissions were combined into one Danube

Commission, but apart from that the system of bilateral agreements was further developed. Multilateral treaty that were signed were the Belgrade Convention (1948, navigation), the Convention concerning fishing in the waters of the Danube (1958, only Soviet block countries) and the five-party convention on the protection of the river Tisza, a major tributary of the Danube, and its own tributaries, against pollution (1986) (Bruhàcs 1993).
With the collapse of communism in the late eighties new opportunities developed. In February 1991 the basin states agreed to develop a Convention on the Protection and Management of the River. Moreover, with the financial support of donors such as the European Union, UNEP, the World Bank and USAID, an environmental programme for the Danube basin was prepared and implemented through a Programme Coordination Unit (ICPDR 2004; Murphy 1997). In 1994 the Danube Convention was signed (Convention 1994) and the (at first Interim) International Commission for the Protection of the Danube River (ICPDR) was established. The ICPDR gradually took over the work of the PCU. Due to the war in the former Yugoslavia, Serbia and Montenegro, and Bosnia Herzegovina acceded to the treaty only in 2002 and 2004 respectively.
The tasks and structure of the ICPDR are similar to those of the ICPR. The ICPDR consists of a conference of the parties (comparable to the Ministerial Conferences in the Rhine basin), a plenary commission, nine expert and working groups and a permanent secretariat, located in Vienna. The Commission has eleven observers, including several professional organizations, the Danube Environment Forum, the World Wildlife Fund and the International Association of Water Supply Companies in the Danube River Catchment Area.

The European Water Framework Directive
Currently the most important factor in the management of the both the Rhine and the Danube basin, at least in as far as water quality and ecology is concerned, is the European Water Framework Directive (2000/60/EC), which was published and thereby entered into force on 22 December 2000 the was officially published (Kallis and Butler 2001; Holzwarth 2002; Nilsson, Langaas and Hannerz 2004; Kaika and Page 2003; Page and Kaika 2003). The WFD establishes a framework for water management in Europe and complements the many previous water directives. The key objective of the directive is to achieve a "good status" for all European waters by 2015. Present and future EU water quality standards have to be met, groundwater resources should not be overexploited, and aquatic ecosystems and associated terrestrial ecosystems should deviate only slightly from their natural state.
The backbone of the Water Framework Directive is a system of river basin management. Member states are obliged to identify their river basins and assign them to "river basin districts". For all districts, national and international, six-yearly river basin management plans and programmes of measures need to be developed. To ensure the necessary national co-ordination, member states need, among others, to identify a "competent authority". For international basins EU member states have to coordinate their activities and they have to “endeavour” to coordinate with non-EU members in the basin (art. 3.5). Finally, public participation plays a crucial role in the WFD. Three times in the planning process public commenting periods have to be organised, and in addition there is a

general requirement to “encourage active involvement” in the implementation of the WFD (Drafting Group 2002).
In the Danube basin the implementation of the WFD is coordinated by the Danube Commission. Implementation in the Rhine basin is coordinated by Rhine Coordination Committee, which also includes basin states that are not a member of the International Rhine Commission. According to the requirements of the WFD, both for the Rhine and for the Danube, characterisation of the basin has been made, the impact of human activities has been assessed and an economic analysis of water use has been made (ICPDR 2005; Rhine basin states 2005). This will serve as a basis for setting environmental objectives in the river basin management plan and for developing programmes of measures to reach these objectives, both due for 2009.
The WFD forces water managers in the different basin states to co-operate even more with other countries and with other policy sectors, such as agriculture (diffuse pollution) and spatial planning. This is the only way to reach the environmental objectives of the Directive. It is important to note in this respect that the European Union’s directive have a very special status. European directives are prepared by the European Commission and enacted by the European Parliament and the Council of (national) Ministers. If afterwards a member state of the EU does not implement a directive correctly, the European Commission can bring the member state before the European Court of Justice and very high fines can be imposed.

4 The Iberian river basins

Few Western European member States are heavily dependent on water from upstream countries. The Netherlands is one; Germany is both upstream and downstream, and in the Mediterranean area, Greece, and above all Portugal are. The difference between the Rhine and the rivers shared by Spain and Portugal is that in the first case it is a quality and flooding problem, while in the second it is a water scarcity and allocation problem. Even though for an economist the cost sharing issue would not be different, Mediterranean countries argue that the water allocation dispute is far more serious than the quality issue.
Spain and Portugal have four principal rivers in common: the Miño/Minho, the Duero/Douro, the Tajo/Tejo, and the Guadiana. All four start from Spain and then enter Portugal, except for the Minho/Miño, which is a boundary between both countries. The estuary of the Guadiana river is a frontier as well.
The dispute has its origin in the century old decision of the Spanish State to ‘regenerate’ the country through the construction of dams and aqueducts or canals devoted to store and transfer water, both to generate electricity and to irrigate. This will eventually reduce the volumes of water available for Portugal, which is dependent on Spanish born rivers for 40% of the total flows.
The first Spanish projects focussed on the Ebro, which is flowing towards the Mediterranean and has only a few small tributaries in France, but no sharing with Portugal. The Ebro gets a lot of water, because it drains the southern slopes of the Pyrenees. Back in 1926, the authoritarian regime of Primo de Rivera created the *Confederación Hidrográfica del Ebro* (“Hydrographic Confederation of the Ebro”),

which developed irrigation colonies in Catalonia and in Aragon. Later, General Franco's government generalised the river-basin approach, and covered the country with *Confederaciones*; after the Civil war, Spain built a large number of dams, so that Spain is now the third country in the world in number of reservoirs.

Portugal also shared the same goal of development through intensification of agriculture. However, the north of the country is water rich through quite heavy rainfall, and south of Lisbon was a territory of very large and extensive land holdings, a quasi-desert. So, the situation was not too conflicting, since agreements had been found for hydroelectricity generation (after navigation at the end of 19th century). Indeed, an old Convention for the regulation and development of hydroelectricity on the international stretches of the Douro river and its tributaries, dating back 1927, was updated and extended in 1964. The 1964 convention assigned parts of the frontier stretches to each country to build its own dams. In 1968 an equivalent Convention was adopted in 1968 for the rivers Minho, Lima, Tejo, Guadiana and Chança, and their tributaries, including the whole river basins in the bargain and not just the frontier sections. Rivers were seen by both countries as functional and productive, not as a territory with many other uses and biodiversity. (See also Gendrot 2003)

Back in 1933, Spanish engineers had started thinking about diverting water from rivers flowing towards Portugal, so as to increase irrigated areas in the rich but dry plains of the South east (Valencia, Murcia, Almeria) and also inland. A first transfer was launched under General Franco in 1971 and inaugurated in 1979: the Tajo-Segura transfer. But the amount of water diverted remained moderate, for climatic reasons and also because of the price of that water.

After the return to democracy, Spain developed a National Water Plan where water should be drawn from the Ebro delta, all the way to the south of Andalucia, the Ebro itself getting support from the Duero, and the latter eventually from the Tejo. This plan was published in 1993 by the socialist government, at a time when the European Union had obtained a direct competency on environmental issues. This meant that the implementation of the plan, which would require financial help from the Commission and from the Cohesion funds, would later be subjected to environmental and economic sustainability reviewing. But within Spain itself, the plan stirred such heated controversy between donor and receiver regions, that it had to be shelved before a vote in the national Parliament (Mezo 1995).

The Portuguese, who were very worried that increasing amounts of water would be diverted towards the Mediterranean took advantage of the situation to negotiate a new convention. The Albufeira convention was signed on November 30, 1998, and its title indicates a much larger scope than previous conventions: "Convention about cooperation for the protection and the sustainable exploitation of water in Luso-Spanish river-basins." In the convention, Spain agreed to postpone its projects to transfer water away from Portugal (Vlachos and Correia 2000).

Portugal did not require their complete abandonment. Portugal water experts were in an awkward situation: they wanted Spain to leave water flows untouched, but eventually would develop similar multipurpose projects in Portugal. In particular, Portugal had finalised an old project to regenerate the Alentejo region thanks to the construction on the Guadiana river of the largest reservoir in Europe, supposed to be the Portuguese Tennessee Valley. This project needed a sufficient water flow from Spain, in return for

which Portugal gave more power generation rights to Spain on the shared rivers further north (Martinez 2004). And, even though the 1998 convention is much more tuned to the new international vision of integrated water management, in practice it leaves possibilities to pursue the former policies, and was immediately criticised as such by academics and environmental movements.
In a second version of the Spanish National Water Plan, adopted in 1999, Spain reduced the transfers to the sole domestic part (from the Ebro delta to Barcelona and to Murcia - Almeria). This reduces the tension with Portugal, but now generates intense controversy inside Spain with Aragon, where more reservoirs should be built. On top of this, the decision of the European Union to stop the funding for lack of appropriate environmental and economic assessment has halted the project. It remains to be seen whether this will give time for a sort of regional *aggiornamento* (less central governments, more regional bargaining on more modest projects).
In the whole process, until now, there has been little public participation. Several reservoirs of this two States project are subject to deep controversy at local level, while the projected water transfers gave rise to enormous protests and demonstrations in the major cities of Spain, in a way yet unseen in any member State.
There has been significant change in favour of a “new water culture”, as witnessed by the development of Iberian congresses organised by very numerous academics from both countries (e.g. Arrojo Agudo and Martinez 1999). This movement was eventually enlarged to the whole European Union and resulted in the Madrid Declaration of Scientists for a New Water Culture (18 February 2005: Arrojo Agudo 2005). The last water framework law adopted by Portugal at the end of 2005 not only incorporates the European Water Framework Directive, but it also creates new river-basin institutions with taxation powers under the polluter-pays and abstractor-pays principles (Ministerio de Ambiente do Ordenamento do Território e do Desenvolvimento regional 2005). This might create a decentralisation movement allowing for more direct bargaining between riparian stakeholders at regional level within the shared river basins.

5 Recommendations

Europe has a long history of transboundary water resources management. Despite some problems, there has been and still is a lot of transboundary cooperation.. If we look more specifically at the experiences in the Rhine, the Danube and the Iberian river basins, there is one factor that stands out: the importance of the political and cultural context.
The political and cultural context has been crucial for both the development and the substance of transboundary water resources management. Geo-political developments such as the First and the Second World War and the collapse of Communism, have at times redrawn national boundaries and necessitated, obstructed and facilitated transboundary co-operation. National factors, such as the absence or presence of decentralisation and public participation and the current “water culture” – large-scale centralised water resources development or decentralised water demand management – have determined the substance of the co-operation. And finally, the European Union plays a crucial role, both in a transboundary and in a national context.

The importance of the context limits the transferability of the experiences described in this paper to other parts of the world. Indeed, every river basin is unique. Yet, there are still some common factors. Section 2 of this paper already presented a general framework for understanding the development of transboundary river basin management and gave a typology of stakeholders. The European experiences described confirm and illustrate different aspects of this framework.
Using the general framework and the European experiences, we can give four recommendations for promoting transboundary water resources management that contributes to the attainment of the Millennium Development Goals:

1. The key activity for promoting transboundary water resources management is to promote the development and implementation of (formal or informal) transboundary agreements (see on the role of international donors in this: Mostert 2005).
2. The political and cultural context should be taken into account or could even be targeted directly.
3. All major stakeholders should be involved in order to maximise the chances of an agreement that actually contribute to the attainment of the Milennium Development Goals and minimise the chance of national opposition that obstructs its implementation. The major stakeholders are not "states", but the different national government bodies, regional and local governments, international governments and donors, the media, civic society, individual water users and/ or influential individuals (cf. Trottier 2003a).
4. Regional organisations such as the EU can play an important supportive role (cf. on Africa: Wirkus and Böge 2005).

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References

— *Act of Mannheim* Revised Convention of 17 October 1868 as set out in the text of 20 November 1963 (Unofficial consolidated text).

— *Adams, A.* (2000): Social Impacts of an African Dam: Equity and Distributional Issues in the Senegal River Valley. Working Paper World Commission on Dams, Thematic Reviews, Social Issues.
http://www.damsreport.org/docs/kbase/contrib/soc193.pdf

— *Arrojo Agudo, Pedro (Ed.) (*2005): Declaration of Scientists for a New Water Culture. http://www.unizar.es/fnca/index3.php?pag=4&id=3

— *Arrojo Agudo, Pedro/ Gil Fco Javier Martinez* (1999): El agua a debate desde la universidad; Hacia una nueva cultura del agua. Zaragoza: Institucion Frenando El Catolico.

— *Brogan, Patrick* (1990): Eastern Europe, 1939-1989 : the fifty years war. London: Bloomsbury.

— *Bruhàcs, Jànos* (1993): The law of non-navigational uses of international watercourses. Dordrecht ; Boston: M. Nijhoff.

— *Burchi, Stefano/ Melvin Spreij* (2003): Institutions for International Freshwater Management. Paris: Unesco.

— *Conference of Rhine Ministers* (2001): Rhine 2020; Program on the sustainable development of the Rhine.

— *Convention, Danube River Protection* (1994): Convention on Cooperation for the Protection and Sustainable use of the Danube River. Sofia, 29 June 1994.

— *Dieperink, Carel* (1997): Tussen zout en zalm lessen uit de ontwikkeling van het regime inzake de Rijnvervuiling. Amsterdam: Thesis Publishers.

— *Dieperink, Carel* (1999): From Open Sewer to Salmon Run: Lessons From the Rhine Water Quality Regime, in: Water Policy. 471-485.

— *Drafting Group* (2002): Guidance on Public Participation in relation to the Water Framework Directive; Active involvement, consultation, and public access to information. Prepared in the Framework of the Common Implementation Strategy of the European Commission and the EU Member States. http://forum.europa.eu.int/Public/irc/env/wfd/library

— *Enserink, Bert/ Dille Kamps/ Erik Mostert* (2003): Public Participation in River Basin Management in the Netherlands; (Not) Everybody's concern. Produced as part of Work Package 4 of the HarmoniCOP project. Delft: RBA Centre, Delft University of Technology. www.harmonicop.info

— *Fisher, Roger/ William Ury* (1981): Getting to yes: negotiating agreement without giving in. Boston: Houghton Mifflin.

— *Garritsen, T./ G. Vonk/ K. de Vries* (2000): Visions for the Rhine. Lelystad: RIZA.

— *Gendrot, Carine* (2003): Circulation de l'eau et espace géographique: politiques et conceptions de l'eau dans les bassins transfrontaliers de la péninsule ibérique, Douro, Tage, Guadiana. Series Circulation de l'eau et espace géographique: politiques et conceptions de l'eau dans les bassins transfrontaliers de la péninsule ibérique, Douro, Tage, Guadiana. Paris: Université Paris I.

— *Gray, Barbara* (1989): Collaborating : finding common ground for multiparty problems. Jossey-Bass management series. San Francisco: Jossey-Bass.

— *Holzwarth, Fritz* (2002): The EU Water Framework Directive - a key to catchment-based governance, in: Water Science & Technology. 105-112.

— *ICPDR* (2004): Active for the Danbube River Basin; 1994 - 2004: Ten years of cooperation in the Danube River Basin. Vienna: International Commission for the Protection of the Danube River.

— *ICPDR* (2005): The Danube River Basin District; River basin characteristics, impact of human activities and economic analysis required under Article 5, Annex II and Annex III, and inventory of protected areas required under Article 6, Annex IV of the EU Water Framework Directive (2000/60/EC).

— *ICPR* (1987): Rhine Action Programme. drawn up by the International Commission for the Protection of the Rhine against Pollution and approved by the 8th Conference of Ministers on the Protection of the Rhine against Pollution, Strasbourg, 1 October 1987.

— *ICPR* (1998): Aktionsplan Hochwasser (Action plan flood protection). Adopted 22 January 1998, Rotterdam.

— *ICPR* (1999): Convention on the Protection of the Rhine.

— *Jesserun d'Oliveira, H.U.* (1987): De vervuiling van de Rijn. Een nieuwe aflevering van het feuilleton: Sandoz en institutionele fricties tussen IRC en EEG. (The Rhine pollution. A new episode in the serial: Sandoz and institutional friction between the IRC and EEC), in: M. V. C. Aalders, G. H. Addink and L. Bomhof (Ed.) (1987), 206 blz.

— *Kaika, Maria/ Ben Page* (2003): The EU Water Framework Directive: Part 1. European Policy-making and the changing topography of lobbying, in: European Environment. 314-327.

— *Kallis, Giorgos/ David Butler* (2001): The EU water framework directive: measures and implications, in: Water Policy. 125-142.

— *Kampa, Eleftheria/ Nicole Kranz/ Wenke Hansen* (2003): Public Participation in River Basin Management in Germany; From borders to natural boundaries. Produced as part of Work Package 4 of the HarmoniCOP project. www.harmonicop.info

— *Klaphake, Axel* (2005): Kooperation an iunternationalen Flüssen aus ökonomischer Perspektive: Das Konzept des Benefit Sharing. Discussion Paper. Bonn: Deutsches Institut für Entwicklungspolitik.

— *LeMarquand, David G.* (1977): International rivers : the politics of cooperation. Vancouver, B.C.: Westwater Research Centre, University of British Colombia.

— *Martinez, Gil Fco Javier (Ed.) (*2004): Una Nueva Cultura para el Guadiana, desde Ruidera a Ayamonte. Zaragoza: Fundacion Nueva Cultura del Agua.

— *Mezo, Josu* (1995): Politica del Agua en España en los años ochenta y noventa: la discusion del plan hidrologico nacional. Madrid: Analistas socio-politicos.

— *Ministerio de Ambiente do Ordenamento do Território e do Desenvolvimento regional* (2005): Lei da Água e Lei da Titularidade dos Recursos Hídricos. www.inag.pt

— *Moe, C. (2000).* (2000): From Scorched Earth to Flooded Earth: The Generals' Dam on Burma's Salween River. Norwegian Burma Council/ Salween Watch coalition. http://www.dams.org/kbase/submissions/showsub.php?rec=SOC057

— *Mostert, Erik* (2003): Conflict and co-operation in international freshwater management; A global review, in: Journal of River Basin Management. 1-12.

— *Mostert, Erik* (2005): How can international donors promote transboundary water management? Discussion paper. Bonn: Deutsches Institut für Entwicklungspolitik.

— *Murphy, Irene Lyons* (1997): The Danube : a river basin in transition. The GeoJournal library ; v. 40. Dordrecht ; Boston: Kluwer Academic Publishers.

— *Nilsson, S/ S. Langaas/ F. Hannerz* (2004): International River Basin Districts under the EU Water

— Framework Directive: Identification and Planned Cooperation, in: European Water Management Online; Official Publication of the European Water Association EWA). www.ewaonline.de/journal/journal.htm

— *Page, Ben/ Maria Kaika* (2003): The EU Water Framework Directive: Part 2. Policy innovation and the shifting choreography of governance, in: European Environment. 328-343.

— *Rhine basin states* (2005): Internationale Flussgebietseinheit Rhein; Merkmale, Überprüfung der Unweltauswirkungen menschlicher Tätigkeiten und wirtschaftliche Analyse der Wassernutzung. www.iksr.de

— *Sadoff, Claudia W./ David Grey* (2002): Beyond the river: the benefits of cooperation on international rivers, in: Water Policy. 389-403.

— *Swain, Ashok* (2000): Water wars: fact or fiction?, in: Futures. 769-781.

— *Trottier, Julie* (2003a): The Need for Multiscalar Analysis in the Management of Shared Water Resources, in: F. A. Hassan, M. Reuss, J. Trottier, C. Bernhardt, A. T. Wolf, J. Mohamed-Katerere and P. v. d. Zaag (Ed.) (2003a), 1-10.

— *Trottier, Julie* (2003b): Water Wars: The Rise of a Hegomonic Concept; Exploring the making of the water war and waterv peace belief within the Israeli-Palestinian Conflict, in: F. A. Hassan, M. Reuss, J. Trottier, C. Bernhardt, A. T. Wolf, J. Mohamed-Katerere and P. v. d. Zaag (Ed.) (2003b),

— *US Department of Labor* (2000): 2000 Update on Forced Labor and Forced Relocations. http://www.dol.gov/dol/ilab/public/media/reports/ofr/burma/forced.htm

— *Vlachos, Evan/ Francisco N. Correia (Ed.) (*2000): Shared water systems and transboundary issues, with special emphasis on the Iberian peninsula. Flad (Luso-American Foundation), with IST-Lisbon and Colorado State Univ.

— *Wirkus, Lars/ Volker Böge* (2005): Afrika's internationale Flüsse und Seen; Stand und Erfahrungen im grenzüberschreitenden Wassermanagement in Afrika an ausgewählten Beispielen. Discussion Paper. Bonn: Deutsches Institut für Entwicklungspolitik.

— *Wolf, Aaron T.* (1998): Conflict and Cooperation Along International Waterways, in: Water Policy. 251-265.

— *Wolf, Aaron T.* (1999): International River Basins of the World, in: International Journal of Water Resources Development. 387-427.

— *Wollebæk Toset, Hans Petter / Nils Petter Gleditsch/ Håvard Hegr* (2000): Shared rivers and interstate conflict, in: Political Geography. 971-996.