



CATÓLICA

UNIVERSIDADE CATÓLICA PORTUGUESA | PORTO
Faculdade de Economia e Gestão

DOCUMENTOS DE TRABALHO

WORKING PAPERS

ECONOMIA

ECONOMICS

Nº 08/2008

SHAPING A NEW LUSO SPANISH CONVENTION

Leonardo Costa
Universidade Católica Portuguesa (Porto)

Josep Vergés
Institut d'Estudis Catalans

Bernard Barraqué
LATTS (ENPC-UMLV)

SHAPING A NEW LUSO SPANISH CONVENTION

Leonardo COSTA(*); Josep C. VERGÉS (**); and Bernard BARRAQUÉ (***)

(* *Faculdade de Economia e Gestão, Universidade Católica Portuguesa at Porto. The researcher acknowledges financial support by FCT, POCI 2010*

FCT Fundação para a Ciência e a Tecnologia

MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR Portugal

Ciência. Inovação 2010 Programa Operacional Ciência e Inovação 2010
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

(**) *Societat Catalana d'Economia, Institut d'Estudis Catalans*

(***) *LATTS (ENPC-UMLV), Centre National de la Recherche Scientifique*

Abstract

In 1998, Portugal and Spain signed, at Albufeira, a Convention to regulate access to their common rivers. Most of them have their upstream basins in Spain and flow into Portugal. A growing water demand in Spain had much reduced their flows into Portugal. The Portuguese priority in the Convention was to assure stream flows for the Alqueva dam, located on the Guadiana River. This paper discusses the functioning of the Albufeira Convention and makes proposals for its revision. The bilateral Commission has hardly operated. In 2005, the exceptional dry year regime has been activated by Spain only on the Duero/Douro River. The Water Framework Directive, the Berlin Rules, Water Markets and the Catalan Voting Rules might help to a revised Convention aiming at better protecting the common rivers.

Albufeira Convention, Water Framework Directive, Berlin Rules, Water Markets, Catalan Voting Rules

1. Introduction

Economic growth generates a growing water demand. Global water needs for agriculture and industry more than doubled in the last 30 years, and are predicted to double every 25 years. In the world, 8% of water uses are domestic, 22% industrial, and 70% agricultural.¹ Irrigated agriculture also is the main source of non-point pollution. Traditionally, the strategy to meet the growing demand for water has been to develop new water supplies. Excess capacity, waste, and environmental impacts often have been by-products of such developments² but today new strategies are being developed to meet the challenges posed by economic growth and the environment. The focus is changing from supply to the demand side of water use. Emphasis is given increasingly to improved efficiency in water allocation and to environmental protection.³

Portugal and Spain have a set of common rivers. Most of these rivers have their upstream basins in Spain and flow into Portugal, to the Atlantic Ocean. In the past decades, a growing water demand in Spain has greatly reduced their flow into Portugal. Recently, Portugal developed Europe's largest dam on its southern low-income Alentejo Region: the Alqueva dam. Its reservoir is predicted to be used to irrigate 110,000 hectares of new irrigated agricultural land in the Alentejo Region, to promote tourism development on this region, to supply water for the Algarve, an important tourist region on Portugal's southern coast, and to supply water for domestic uses and irrigation on the Spanish Extremadura Region.⁴ Table 1 shows the basins of the common rivers and their shares.

¹ In countries such as Portugal and Spain, the agricultural sector accounts for more than 80% of water uses.

² See Vergés (2001, 2002, 2004, 2005, 2006b) for a critique of the Alqueva dam, in southern Portugal, and Barraqué (2000a,b), and Vergés, 2000a, for a critique of the aborted Languedoc-Roussillon-Catalogne (LRC) aqueduct, to supply Barcelona with Rhone water. A presentation of 'hydrodinosaurs' (large and controversial hydraulic projects like the Canada – U.S. transfers) is available within the web site of the French Association of Hydrological Sciences: <http://www.hydrologie.org>.

³ In 2000, the European Union approved the Water Framework Directive (WFD), which points for full cost recovery and expands the scope of water protection.

⁴ The Alqueva dam has 3,150 hm³ of useful capacity, more than 50% of previous dam useful capacity in Portugal (6,000 hm³, of which 4,690 hm³ installed on the common rivers). See INAG (2001) and Vergés (2001, 2002, 2004, 2005, 2006b).

Table 1 Common river basin shares

River Basin	Surface (km ²)			Percentage	
	Spain	Portugal	Total	Spain	Portugal
Minho	16230	850	17080	95%	5%
Lima	1300	1180	2480	52%	48%
Duero/Douro	79000	18600	97600	81%	19%
Tagus	55800	24800	80600	69%	31%
Guadiana	55300	11500	66800	83%	17%
Total	207630	56930	264560	78%	22%

Source: Elaborated from INAG (2001), Portuguese National Water Plan.

Spain has the bulk of the basin areas (78%), being mostly in an upstream position. Table 2 shows annual average natural flows and dam capacity installed on the common rivers. About 68% (42,800 hm³) of annual natural stream flows had its origin in Spain. Spanish dam capacity is high on all the common rivers. This fact is particularly relevant for Portugal, mostly in a downstream position. Dam capacity intensity (measured in hm³ of capacity per km² of shared basin) is, in general, higher in Spain than in Portugal, and particularly so on the Minho, Tagus, and Guadiana Rivers.

Table 2: Natural flows and dam capacity on the common rivers

River Basin	Annual average natural flows			Dam capacity			
	Spain (1)	Portugal (2)	Total	Spain		Portugal	
	hm ³ /year	hm ³ /year	hm ³ /year	hm ³	hm ³ /km ²	hm ³	hm ³ /km ²
Minho	11100	1000	12100	2880	0,18	0,20	0,00
Lima	1600	2000	3600	170	0,13	400	0,34
Duero/Douro	13700	9200	22900	7670	0,10	1080	0,06
Tagus	10900	6200	17100	11140	0,20	2750	0,11
Guadiana	5500	1900	7400	9220	0,17	460*	0,04
Total	42800	20300	63100	31080	0,15	4690	0,08

*Before the Alqueva dam was installed on the Portuguese Guadiana, with 3,150 hm³ to be added.

(1) Computed with monthly data (1941-1996). (2) Computed with monthly data (1941-1991)

Source: Elaborated from INAG (2001), Portuguese National Water Plan.

Spain proposed and developed multibillion-euro plans for water infrastructures aimed to serve irrigated agriculture, but also tourism and urban development in the Mediterranean. A wasteful water administration has made Spain the largest water consumer in Europe. Spain more than doubles the average European water consumption per head (Table 3). The reality is that the main European countries consume a tenth of what Spain does. Spain has one third of all irrigation in Europe and Mediterranean Europe accounts for 94% of all European irrigation (Table 4).

Table 3: European water use

Country	m ³ /head	Index EU = 100
Spain	530	256
Portugal	339	164
France	125	60
Germany	71	34
United Kingdom	51	25
European Union-15	207	100

Source: Elaborated from Ministerio de Medio Ambiente (1998), Libro Blanco del Agua.

Table 4: European Irrigation

Country	hm ³ /year	% EU
Spain	24,094	33%
Portugal	3,834	5%
Mediterranean Europe (1)	69,058	94%
European Union-15	73,658	100%

Note (1) Spain, Portugal, France, Italy, and Greece
Source: Vergés (2000b), Impact of Water Pricing.

Spain has had two failed Hydrological Plans in the last decade based on water transfers. The 2000 Plan cancelled all the 1993 Plan new water transfers that affected Portugal but kept the Ebro transfer south, with an aqueduct from the Catalonia Ebro delta down to Almeria. The new socialist government, with parliamentary support of Catalonia (the region losing the water), cancelled this last transfer. The story of the collapse of new water transfers in Spain can be seen in Table 5, from 2,945 hm³/year planned in 1993 to 1,000 hm³/year in 2000 to zero in 2005.

Table 5: The collapse of planned new water transfers in Spain

Planned new Water transfers from:	1993 Plan hm ³ /year	2000 Plan hm ³ /year	2004 Plan hm ³ /year
Rivers flowing into Portugal:	1570	0	0
Tagus	985	0	0
Duero/Douro	535	0	0
Guadiana	50	0	0
Mediterranean Rivers:	1375	1000	0
Ebro	1325	1000	0
Andalusian rivers	50	0	0
Total planned transfers	2945	1000	0

Source: Elaborated from Vergés (2002), El saqueo del agua en España.

There is little danger of Spanish hydrodinosaurs coming back. The new government left water “needs” unchanged and simply substituted transfers with desalination plants. However, only one in five projects is being built.⁵ At full cost pricing advocated by the E.U., the treated sea water will cost farmers five times the price they paid by the Tagus-Segura transfer⁶ and thus they refuse to sign on. The 2000 Plan already warned of the dangers of economic reality to grand scale planning, even going so far as to admit “real water costs” would make transfers impossible and baldly stating that real prices would not be assigned to transfers “for the moment.” Indeed, Spanish River Basin authorities, the Confederaciones Hidrográficas, only recover 15% of irrigation costs. Even recovering a modest 50% of costs, farmers would switch one third of irrigated to dry land, with an area equivalent to the entire irrigation in Portugal.⁷

Portugal has also developed River Basin Plans (RBPs) in 2000, a National Water Plan (NWP) in 2001 and a new water law in 2005. Although the RBPs and the NWP claim their focus is on water demand their concern is mainly with water supply.⁸ The Alqueva dam project is the major investment on supply development outlined in the Portuguese NWP. Recently, the Portuguese Government has decided to anticipate ten years the predicted investment on the Alqueva project, from 2025 to 2015, supporting it as a national priority.⁹

⁵ “Bruselas critica el retraso en la construcción de las desaladoras,” El Pais, 29th March 2006.

⁶ Until now the highest surface water price in Spain.

⁷ See Vergés (2006a).

⁸ See Costa (2001, 2003) and Costa and Monke (2002).

⁹ Público, 17th March 2006.

At the end of 1998, Portugal and Spain signed a Convention regulating access to their common rivers. This year (2006), the Convention is being renegotiated between the two countries. In section 2 we discuss international water law, the allocation rules of the Albufeira Convention for the common rivers and the way it has worked out in the past six years. In section 3, we discuss how to use the E.U. WFD, the Berlin Rules from ILA, Water Markets, and Catalan Voting Rules, in order to better protect the common rivers in a revised Luso Spanish Convention (LSC). In section 4 we present our conclusions.

2. The Albufeira Convention

2.1. International water law

When the Albufeira Convention was signed, in 1998, the WFD was still being discussed. The Convention has been influenced somehow by the WFD discussion. However, its legal support is based merely on international water law. Except for treaties or conventions ratified by governments, international laws are not binding. There are hundreds of treaties dealing with water issues and signed by two or more nations. The Albufeira Convention is a bilateral treaty signed by the governments of Portugal and Spain.

Four doctrines emerge from international law: The Harmon Doctrine; The ILA Helsinki Rules; The ILC Recommendations; and the ILA Berlin Rules. In 1885, asked about the rights Mexicans had to the Rio Grande waters, U.S. Attorney General Judson Harmon said the U.S. was entitled to do as it pleased with the waters flowing in its territory without regard for downstream users. The concept of absolute sovereignty was born, also known as the Harmon Doctrine. The world has spent much of the twentieth century fighting over it.

The 1966 ILA Helsinki Rules are based on the sharing of international waters.¹⁰ They address the equitable use of water, pollution, navigation, and conflicts between states about international basins. The equitable use of water establishes that all states that have a portion of an international river basin have the right to a reasonable share of its waters. Reasonable sharing considers geography, hydrology, climate, past and present uses, the economic and social needs of the States, the population depending on the waters, the cost of alternative ways to satisfy the needs of each State, and monetary compensation. In the Helsinki Rules, “equitable use” applies mainly to water quantity issues, whereas “non-significant harm” applies to pollution issues.

The third legal doctrine is provided by the ILC Draft Articles Recommendations, approved in 1997, in New York, by the U.N. General Assembly.¹¹ The recommendations follow very closely the Helsinki Rules. They attempt to better define “equitable use” and “non-significant harm”. They establish the obligation to exchange data and information and to cooperate. When facing water conflicts, States should follow the U.N. recommendations, including, if necessary, to present their claims to the International Court of Justice.

The fourth legal doctrine results from the ILA Water Resources Committee efforts to revise the Helsinki Rules. On one hand, as stated, the principle of “equitable use” didn’t prevent unsustainable water consumption by States. For instance, by the Helsinki Rules, somehow,

¹⁰ Utton (1996); Dellapenna (1999).

¹¹ By 1970, the U.N. General Assembly had instructed the ILC to study the “Law of Water Courses for Purposes Other than Navigation”. After several decades of deliberation, the ILC released its recommendations. The ILC published its Draft Articles in 1994. In 1997, the U.N. General Assembly in New York approved the ILC recommendations (1997 United Nations Convention on the Law of the Non-navigational Uses of International Watercourses). Up to the moment, only a few countries have ratified the 1997 New York U.N. Convention. Portugal has ratified this Convention. Spain still hasn’t.

States were invited to use water as a way to gain rights on it.¹² On the other hand, there was a need to restate the Helsinki Rules in order to make compatible the principle of ‘equitable use’ with the principles of ‘integrated management’, ‘precautionary’, and ‘sustainable development’.¹³ The Revised Helsinki Rules, The Berlin Rules on Water Resources, have been released in 2004.¹⁴

2.2. The Albufeira Convention allocation rules

The Albufeira Convention applies to the Minho, Lima, Duero/Douro, Tagus, and Guadiana Rivers, that flow to from Spain to Portugal, and covers issues such as exchange of information, information of the public, consultation on transboundary impacts, evaluation of transboundary impacts, pollution control and prevention, water uses, water streams, droughts and resource scarcity, assignment of rights, dispute resolution, etc.¹⁵ The Convention follows very closely the recommended rules of international water law, particularly the 1997 New York Convention (ILC Draft Articles) and the International Court of Justice dispositions. Although not explicitly mentioned¹⁶, the “equitable use” of water is applied in allocating water quantity. The Convention establishes stream flow allocation rules on the common rivers. “Non-significant harm” is limited to cases of environmental damage. All the international recommendations to solve potential conflicts were adopted. The Convention created as cooperation organs the intergovernmental technical commission CADC, to exchange information concerning hydrologic data, new water uses, transboundary environmental impacts, etc., and to make proposals; and a political Conference of the Parties (headed by a Minister of each State), to take decisions.

Except for the Lima River, the Convention established annual guaranteed stream flows to Portugal in normal years. Critics complained that the guaranteed stream flows had been set too low.¹⁷ Spain promised to supply only one third of the water that flowed to Portugal in recent decades. Further, the guarantees apply only in normal rainfall years. In exceptionally dry years, Spain is bound only by the “Non-significant harm” rule. Only for the Guadiana River, the definition of a normal year depends also of the volume of water accumulated by Spain in its dams on this river. By transferring water from northern basins to the Guadiana River Basin, Spain reduces the number of exceptional dry years in this river.¹⁸

The “non-significant harm” rule was expected to mean that Spain would supply to Portugal at least the ecologically stream flows in dry years, once the CADC established them. There are proposals for these stream flows in the Portuguese NWP. However, six years after the application of the Convention, the ecological stream flows are still to be established by the CADC. Table 6 lists 30 year average observed annual flows¹⁹, guaranteed annual stream flows, and Portuguese ecological stream flow proposals. Spain guaranteed in normal years about one third of average stream flow into Portugal. The proposed ecological stream flows are close to or surpass the annual stream flows guaranteed in normal years. These results support the claim that the Convention guarantees Portugal extremely low stream flows. For some it was not certain that the guaranteed stream flows would prevent environmental

¹² Costa (2003).

¹³ Dellapenna (1999).

¹⁴ ILA (2004).

¹⁵ Articles 5,6,8,9,14,15,16,19,24,26 in the LSC (1998).

¹⁶ Sereno (2004).

¹⁷ APRIL et al. (1999); CNA (1999); Correia (1999).

¹⁸ Costa (1999, 2000, 2001, 2003) and Costa and Monke (2002).

¹⁹ 20 year average for the Minho, 30 year average for the Duero/Douro, 53 year average for the Tagus, current stream flow for the Guadiana (APRIL et al., 1999).

damage in estuaries.²⁰ In many ways, not only the amount of water flowing in matters but also when it flows.²¹ Seasonal stream flows have been proposed in the Portuguese NWP. Again, they are still to be established by the CADC.

Table 6, Annual stream flows received, guaranteed by the Albufeira Convention, and Portuguese proposals

River Basin	Annual stream flows (hm ³)				
	Average	Guaranteed	Ecological (1)		
			average year	very dry year	very humid year
Minho	9740	3700	2627	1421	4449
Lima	n.a.	n.a.	506	174	958
Duero/Douro	9000	3500	3081	1118	5112
Tagus	9500	2700	3032	1000	5848
Guadiana	1540	600	1766	162	4140

Source: Elaborated from LSC (1998), APRIL et. al (1999), and INAG (2001).

In 1998 the Portuguese and Spanish governments had a map of preferences on water uses of the common rivers, an order of priorities.²² Subject to “equitable use” and “non significant harm” restrictions, this order of priorities dictated allocation rules and/or established the guaranteed stream flow regime in the common rivers. The established rules differ in the Guadiana River. Portugal welcomes water transfers in Spain from northern River Basins to the Guadiana River Basin, as by the accorded rules they reduce the number of exceptional years in the Guadiana River and thus guarantee water flows for the Alqueva dam.²³

The guaranteed flow in the Convention is 34% average 30 years flow, but the Guadiana and the Duero/Douro Rivers obtain a higher guarantee, 39% than the Tagus 28%. This means that there is a virtual guaranteed flow transfer from the Tagus to the Duero/Douro and Guadiana, the latter essential for the Alqueva dam.²⁴ The virtual guaranteed flow transfers by the Convention are shown in Table 7. Both the Guadiana and the Duero/Douro gain at the expense of the Tagus, which loses a guaranteed 524 hm³/year. The Guadiana gains an extra 15% guaranteed flow or 77 hm³/year and the Duero/Douro the same proportion or 446 hm³/year.²⁵

The significance of the virtual guaranteed flows transfers can be seen by contrasting with the real projected transfers of the failed Spanish plans in Table 5. In normal years, the Duero/Douro is guaranteed an amount of water above the average guaranteed on the common rivers close to what was to be withdrawn by Spain. The Guadiana gets 50% more. This shows that the virtual guaranteed flow transfers in the Albufeira Convention were “compensations” for the real transfers planned by Spain for its exclusive use.²⁶ The total of the virtual

²⁰ Bordalo e Sá (1999).

²¹ Serra (1999).

²² Costa (1999, 2000, 2001, 2003), Costa and Monke (2002), and Vergés (2001, 2002, 2004, 2005, 2006b).

²³ According to Costa (1999, 2000, 2001, 2003), Costa and Monke (2002), and Vergés (2001, 2002, 2004, 2005, 2006b) the Portuguese priority in the Convention was to guarantee the stream flows needed for the Alqueva dam project in the south. The flow of 600 hm³ guaranteed for the Guadiana River equals the water to be transferred from the dam to irrigation in the Alentejo region (550 hm³), and the southern tourist region of Algarve (50 hm³). On these numbers see INAG (2001).

²⁴ The latter is essential because average 50 year flow from Spain has a minimum of 162 hm³/year and an average for dry years, which occur once a decade, of only 408 hm³/year. The average flow for the Guadiana is 1,540 hm³/year.

²⁵ The Portuguese Water Institute supports the Convention stopped Spain using the Duero/Douro as its main northern supply basin.

²⁶ According to the Spanish White Paper on Water (*Libro Blanco*) the LSC was established because of the 1993 Plan for Spanish water transfers: "The transfer plans in the 1993 Plan, which affected the Duero/Douro, the Tagus and the Guadiana

guaranteed flow transfers as seen in Table 7 are zero gains for Portugal. Extra average guaranteed flows gained by the Guadiana and the Duero/Douro were lost by the Tagus.

Table 7: Guaranteed flow transfers by the Albufeira Convention

River	Average hm ³ /year	Guaranteed flow hm ³ /year	34% average hm ³ /year	Guaranteed flow transfer hm ³ /year
Duero/Douro	9000	3500	3054	446
Tagus	9500	2700	3224	-524
Guadiana	1540	600	523	77
Total flows	20040	6800	6800	0

Source: Elaborated from table 6.

In exceptional dry years, the allocation rules barely protect not only the Tagus River but also other northern rivers such as the Duero/Douro River.²⁷ The use of the Duero/Douro River Basin as a supply basin to southern basins seems to have been abandoned. However, irrigation has increased and is still increasing on the Spanish Duero/Douro. The 1995 Duero Plan had planned 306,475 ha new irrigation over 20 years.²⁸ Total water use was 93% irrigation, as shown in Table 8, with a planned growth of still over 1,000 hm³ in irrigation even after applying the Brussels directives. The 1998 figures show real consumption with a growth from the 1995 Plan of 717 hm³/year. The predicted ten year growth of the 2005 Duero/Douro Plan is much more modest, 280 hm³/year, leaving for a nebulous future the real increase in irrigation if investment is forthcoming. Currently only 50% of costs are recovered, despite the new European rules.²⁹

Table 8: The continued growth of irrigation in the Spanish Duero

Spanish Duero/Douro River Basin	1994 hm ³ /year	1998 hm ³ /year	2008 hm ³ /year	2018 hm ³ /year
Irrigation	3603	3480	3703	4572
Potable and industrial	257	1097	1154	1246
Total consumption	3860	4577	4857	5818
Real and planned increases		717	280	961
Cumulative increases		717	997	1958

Source: Elaborated from Confederación Hidrográfica del Duero (1995, 2005).

2.3. The Convention working

Between 2000 and 2005, Portugal has had six ministers responsible for the water sector.³⁰ The new Portuguese water law has been approved only in December of 2005. The Portuguese water political instability is probably the major cause of the failure of the CADC created with the Convention. The first Conference of the Parties, after the Convention implementation in 2000, occurred almost five years later, in July of 2005.³¹ The CADC only recently has been activated. The CADC failure meant that a set of practices, such as information exchange, mostly have not been implemented and that issues that were to be set between the two

rivers created a very obvious worry in Portugal leading to the 1993 Spanish-Portuguese Summit which established a new Convention that culminated with its signature in 1998." See MMA (1998).

²⁷ Costa (1999, 2000, 2001, 2003), and Costa and Monke (2002).

²⁸ Confederación Hidrográfica del Duero (1995).

²⁹ In 1999, after the Convention was signed but before it was implemented, the Portuguese Conselho Nacional da Água declared that the Duero/Douro River stream flow reduction already had caused a loss on hydroelectric power of 44,4 € millions annually. It also predicted a loss rising 39%, to € millions 62,3 (1999 prices), in the absence of water transfers in Spain from the Duero/Douro River Basin to other basins, and rising 72%, to € millions 77,3 (1999 prices), in the presence of a 1000 hm³ of such transfers (CNA, 1999; Público, 26th March of 1999).

³⁰ Before Nunes Correia, the ministers responsible for the environment and the water sector have been José Sócrates, Isaltino Morais, Amílcar Theias, Arlindo Cunha, and Luís Nobre Guedes.

³¹ Jornal Notícias, 28th July of 2005.

countries, such as the ecological stream flows of the common rivers, were not. Mostly, the Convention did not work properly. However, the two countries have complied with the water allocation rules established in it.

In 2005 Spain declared for the first time an exceptional dry year in one of the rivers: the Duero/Douro River. Also, the CADC has been reactivated.³² The Duero/Douro was the only river where Spain has activated the exceptional dry year clause. It was visible that Spanish dams on the Duero/Douro had much more water stocked than the downstream Portuguese dams. Some advocated the construction of the Foz Coa dam or the Sabor dam, on the Portuguese Duero/Douro Basin, as a way to generate stream flows and compensate the lack of water coming from Spain.³³ Portugal and Spain ended up agreeing a reduction of the guaranteed stream flow of the Duero/Douro River, whenever the exceptional dry year clause is activated.³⁴

3. What has to be done?

The Albufeira Convention signed in 1998 followed very closely the 1997 New York Convention recommendations (ILC Draft Articles). The principle of 'equitable use' of Helsinki Rules and of ILC recommendations is not able to prevent unsustainable uses of water. The Convention supports this idea, given the type of cross basins transfers and hydrodinosaurs it supports. But there is more to say. From the stand of the Berlin Rules and of the WFD, the transboundary environmental impact considered by the Albufeira Convention is narrow. Point 3 of Annex II of the Convention lists the conditions in which a transboundary impact is evaluated by the Parties in the CADC. The conditions are one of the following: a) the distance from the border reached is less than 100 km; a significant change of the water flow regime; discharges containing some of the polluting substances referred in Annex I. On one hand, the estuaries of the shared rivers, particularly of the Duero/Douro and Tagus Rivers, are more than a 100 km away from the Portuguese Spanish border. On the other hand, the flows guaranteed by the Convention in normal years are low, and the ones guaranteed in dry exceptional years have not been established. Thus, one can say the estuarine ecosystems are not protected by the Convention while Art. 24 of Berlin Rules 'States shall take all appropriate measures to ensure flows adequate to protect the ecological integrity of the waters of a drainage basin, including estuarine waters'.

The Revised LSC should have two pillars: The WFD and the Berlin Rules. The WFD follows the principle of optimal development of waters without regard for national boundaries. It aims to protect all waters from further deterioration and seeks the improved status of waters by 2015. The Directive sets emission controls and environmental quality standards; encourages water pricing at full cost recovery; and promotes planning and management of water based on river basins. The WFD protects more water quality than water quantity. However, first flows are necessary to prevent environmental damage, for instance, on the estuary zones. Second, environmental quality standards are defined as concentrations of particular pollutants or group of pollutants. Third, full cost recovery can be understood as a way to avoid hydrodinosaurs, to promote more sustainable uses of water, and to protect water flows.

³² The ambassador Antas de Campos, the Portuguese coordinator of CADC, complained about the difficulties he had to activate the CADC. He said that in the last two years he had not received the rainfall bulletins from Spain. Therefore, the declaration of an exceptional dry year on the Duero/Douro by Spain has been a surprise. The exceptional dry year regime allows Spain to release less than 3500 hm³ in the Duero/Douro River. Experts insist to the need to revise the stream flows regime in the Minho, Duero/Douro and Tagus Rivers. The exception is the Guadiana River, where the stream flows are measured every second. www.observatorioalgarve.pt, 12 March of 2005.

³³ Correio da Manhã, 24th June of 2005.

³⁴ Jornal Notícias, 28th July of 2005).

According to the WFD, measures are outlined in River Basin Management Plans (RBMPs), which cover a six-year period. Ground and coastal waters are assigned to the most appropriate river basins, which include estuary zones. Member States shall encourage the active involvement of interested parties, particularly, in the production, reviewing and updating of the RBMPs (Article 14 Public Information and Consultation). For common rivers, Member States are invited to have common RBMP ready by 2015. The WFD requires more involvement of interested parties and much information exchange and consultation.

Like the WFD, the Berlin Rules also point for participation by persons, conjunctive management, integrated management, sustainability, and minimization of environmental harm.³⁵ For international shared waters, among other, the Berlin Rules force the principle of “equitable utilization” to be consistent with the “non significant harm” principle and with adequate protection of the waters.³⁶ That is, “the right to an equitable use and reasonable share of the waters carries with it certain duties in the use of those waters”. Past uses have been eliminated from the list of relevant factors in determining an equitable and reasonable use.³⁷ “In determining an equitable and reasonable use, States shall first allocate waters to satisfy vital human needs”.³⁸ “No other use or category of uses shall have an inherent preference over any other use or category of uses”.³⁹ Like the WFD, The Berlin rules preclude, for instance, irrigation to have an inherent preference over other uses. Concerning ecological flows, the Berlin Rules state that “States shall take all appropriate measures to ensure flows adequate to protect the ecological integrity of a drainage basin, including estuarine waters”.⁴⁰ That is, the duty of preserving minimum stream flows is recognized. Their establishment shall take into account the integrity of the entire river basin and not only bordering areas. Still concerning the ecological integrity of a river basin, “States shall take all appropriate measures to prevent the introduction, whether intentionally or otherwise, of alien species into de aquatic environment if the alien species might have a significant adverse effect on an ecosystem dependent on the particular waters”.⁴¹ This goes further than the U.N. 1997 New York Convention, as it does not require a threat of significant harm to other States in the basin.⁴² This article and the full cost recovery of the WFD imply that water transfers across basins shall be the exception and not the rule. That is, water highways and hydrodinosaurs shall be avoided.

What has to be done? Common River Basin Authorities should be developed between Portugal and Spain for the common rivers to elaborate and implement Common River Basin Management Plans. The role of the new CADC should be to support these Iberian River Basin Authorities. The ecological integrity of the common rivers requires the establishment of ecological stream flows and quality standards on critical points of the common River Basins, as the estuarine zones. Subject to the ecological integrity of the Common River Basins, to restrictions aimed first to allocate waters to satisfy vital human needs, protect traditional farming, and/or other vulnerable communities⁴³, and to consistency with the Berlin Rules

³⁵ Articles 4, 5, 6, 7, and 8 (ILA, 2004).

³⁶ Article 12 (ILA, 2004).

³⁷ Article 13 (ILA, 2004).

³⁸ Article 14 (ILA, 2004).

³⁹ Article 14 (ILA, 2004).

⁴⁰ Article 24 (ILA, 2004).

⁴¹ Article 25 (ILA, 2004).

⁴² ILA (2004).

⁴³ According to the Berlin Rules (ILA, 2004) “States shall take all appropriate steps to protect the rights, interests, and special needs of communities and of indigenous peoples or other particularly vulnerable groups likely to be affected by the management of waters, even while developing the waters for the entire benefit of the State or group of States” (Article 20).

principle of “equitable utilization”, and with the WFD full cost recovery, Portugal and Spain should develop flexible allocation rules that shall allow for optimal use and development of waters without regard to national boundaries. For the optimal use of present water supplies, River Basin Water Rental Markets among users, without regard for nationality, should be established. The Berlin Rules principle of “equitable utilization” should be used to set up the initial allocation of rights between users of the two countries.⁴⁴ Countries can also respond within equity concerns with their initial distribution of rights among users.

Concerning new water supply development projects voting rules are important. Water use rules can easily lead to abuse because Spain controls the vast majority of the territory and water of the common rivers. Straight majority voting for water new supplies would let Spain always dominating the outcomes or lead to deadlocks. A better situation would be to take the dissent rule of Catalan parliaments before they were abolished by force in 1716. First, all complaints were dealt with and only then taxes raised by the king who after 1492 was also the monarch of the Spanish confederation. Historian J.H. Elliott explains:⁴⁵ “The Catalan Corts, unlike those of Castile, worked more to the advantage of the Principality than to that of the prince. The granting of a subsidy or service, an act known significantly enough as an act of grace, took very much third place to matters of justice: the redress of grievances and the amendment of laws. Debate in the Corts of Catalonia bore no relation to those in the 17th Century English Parliament. In an institution primarily concerned with defending the rights of a subject, the Catalans had devised a unique form or procedure which gave the individual member of the Corts unlimited power over the proceedings of the body. This was known as an act of dissent or dissentiment. Nothing could be considered expect the point raised in the dissentiment. This unusual method of conducting business gave the Corts a real protection against any attempt by the Crown to impose its desires.”

Applying this Catalan voting rule produces different results from majority voting. The year Franco died, J. C. Vergés published his first paper on water considering two sets of beneficiaries and three different alternatives.⁴⁶ Table 9 shows that Franco’s attempt to build an Ebro transfer was only one of seven solutions when allowing for dissent or dissentiment by the weaker party, which in the Ebro were the rural areas who exported the water. Even if the transfer was the policy with most benefits, it would not be adopted, because with dissent policies 2, 3 and 4 would be preferred, with receding order of benefits provided for both parties. Franco’s Ebro transfer, just like Aznar’s was never built. The dissent rule would protect Portuguese interests, and avoid unnecessary infrastructure on both sides of the border, since no policy could be applied in the Common River Basins without full agreement. The dissent rule is increasingly in use in the modern world, as shown in no fault divorce and no fault car claims, which mean, like in the Catalan Corts, no dissent by all.

4. Conclusions

The ecological integrity of the common rivers requires the establishment of ecological stream flows and quality standards on critical points of the common River Basins, as the estuarine zones. Subject to the ecological integrity of the Common River Basins, to restrictions aimed

⁴⁴ That is, guaranteed stream flows of the Revised LSC shall take into account the flows necessary to comply with restrictions such as ecological integrity of the Common River Basins, satisfaction of vital human needs, protection of traditional farming and/or other vulnerable communities, and the flows corresponding to the initial allocation of tradable rights between users of the two countries.

⁴⁵ J.H. Elliott, pages 218-221 (1963).

⁴⁶ J.C. Vergés (1975).

Vergés J.C. (1975) “Participación privada en el agua pública. Una política ambiental abierta para España” *Moneda y Crédito*, December 1975, No. 135: 29-42.

first to allocate waters to satisfy vital human needs, protect traditional farming, and/or other vulnerable communities⁴⁷, and to consistency with the Berlin Rules principle of “equitable utilization”, and with the WFD full cost recovery, Portugal and Spain should establish water user rights and develop flexible allocation rules of these rights that shall allow for optimal use and development of waters without regard to national boundaries.

Table 9 Ebro outcomes with the Catalan Dissent Rule

Policy adopted	Transfer	Sewage plants	Irrigation	Benefits Barcelona/Tarragona	Benefits Aragon / Catalan Ebro	Total Benefits
1. Transfer	100	0	0	200	-50	150
2. Trans./Irr.	50	0	50	100	50	150
3. Trans./Sew./Irr.	50	25	25	75	25	100
4. Trans./Sew./Irr.	25	25	50	25	50	75
5. Trans./Sew.	50	50	0	50	-50	0
6. Sew./Irr.	0	50	50	-50	50	0
7. Sewage	0	100	0	-100	-50	-150

Source: Vergés (1975). Polices adopted add to 100. Benefits of transfer and sewage treatment count double and loss of irrigation is negative.

As flexible allocation rules, we propose for the common rivers River Basin Water Rental Markets, of tradable user rights without regard for nationality, in the use of present water supplies, and the Catalan Voting Rules for the development of new water supplies. The Revised LSC should keep the CADC and the Conference of the Parties. However Common River Basin Authorities should be established for all Common Rivers. The role of the CADC should be to inform and support the works of these Common River Basin Authorities and not to substitute those.⁴⁸ Proposals like the ones we formulate in this paper will be all the more needed as the time of European subsidies comes to an end.

References

- Associação Política Regional de Intervenção Local *et al.* (1999): “Convenção sobre a Cooperação para a Protecção e Aproveitamento Sustentável das Águas das Bacias Hidrográficas Luso-Espanholas”. Selecção e Organização da APRIL. Antologia *Os poderes públicos, a convenção de Albufeira e a gestão da água em Portugal*. Porto, Março de 2005.
- Barraqué, B., ed. (2000a), ‘Les demandes en eau en Catalogne : perspectives européennes sur le projet d’aqueduc Rhône-Barcelone, in Multi-usages et gestion de l’eau en Méditerranée, *Revue de l’économie méridionale*, n° spécial, 191, 2000-3 vol. 48
- Barraqué, B., ed. (2000b) Water demands in Catalonia: a European perspective on the projected Rhone to Barcelona water transfer. Ministère de l’Environnement, Direction de l’Eau, Paris.
- Bordalo e Sá, A. (1999): “Convenção Luso-Espanhola: Acordo ou Hipoteca?”. In Selecção e Organização da APRIL, Antologia *Os poderes públicos, a convenção de Albufeira e a gestão da água em Portugal*. Porto, Março de 2005. Comunicação, Porto, Março de 1999.
- Conselho Nacional da Água (1999): Apreciação N°01/CAN/99 relativa à Convenção sobre Cooperação para a Protecção e o Aproveitamento Sustentável das Águas das Bacias Hidrográficas Luso-Espanholas. Lisboa, Conselho Nacional da Água (CNA), 1999.
- Confederación Hidrográfica Del Duero (1995): Plan Hidrológico del Duero.
- Confederación Hidrográfica Del Duero (2005): Informe resumen de los arts. 5 y 6 de la Directiva Marco Agua.

⁴⁷ According to the Berlin Rules (ILA, 2004) “States shall take all appropriate steps to protect the rights, interests, and special needs of communities and of indigenous peoples or other particularly vulnerable groups likely to be affected by the management of waters, even while developing the waters for the entire benefit of the State or group of States” (Article 20).

⁴⁸ The Portuguese 2005 water law is not totally inconsistent with our proposals, creating 5 River Basin Authorities with taxation powers under polluter-pays and abstractor-pays principles and consultative councils made up with water users, administrations and local authorities. However, it yields the Water Institute (the national authority) special prerogatives on the common river basins, at the expense of River Basin Authorities.

Correia, F. N. (1999): O Regime de Caudais na Convenção Luso-Espanhola. In Encontro sobre a Convenção Luso-espanhola de Recursos Hídricos - Ganhos e Perdas para Portugal a Curto e Médio Prazo. Instituto Superior Técnico, Lisboa.

Costa, L. (2003): A Portuguese hydrodinosaur: the hidden costs of the Alqueva dam. Hydrodinosaurs - Portugal, Available in <http://www.hydrodinosaurs.fr.st>.

Costa, L. (2001): Control of Water Use in Northwest Portugal. PhD Dissertation. Department of Economics. Tucson, The University of Arizona.

Costa, L. (2000): "Adeus Rio do Ouro". In Seleção e Organização da APRIL, Antologia *Os poderes públicos, a convenção de Albufeira e a gestão da água em Portugal*. Porto, Março de 2005. Comunicação apresentada nas VII Jornadas Florestais - A Floresta e os Recursos Hídricos, Escola Superior Agrária de Bragança, 2000.

Costa, L. (1999): Quatro por Um. Texto de opinião. Porto, 1999.

Costa, L, and Eric A. Monke (2002): "As políticas da água em Portugal". *Tecnologia da Água*, Outubro'02, Edição II.

Dellapenna, J.W. (1999): "The Customary International Law of Internationally Shared Fresh Water Resources". In Vlachos, E. & Correia, F.N., coord. *Shared Water Systems and Transboundary Issues with Special Emphasis on the Iberian Peninsula*. Lisbon, Luso-American Foundation, Instituto Superior Técnico - Portugal, and Colorado State University - USA.

Elliott, J.H. (1963) *The Revolt of the Catalans*, Cambridge.

Instituto Nacional da Água (2001): Plano Nacional da Água. Disponível em http://www.inag.pt/inag2004/port/a_intervencao/planeamento/pna/pna.html

International Law Association (1967): The Helsinki Rules on the Uses of the Waters of International Rivers. Adopted by the International Law Association at the fifty-second conference, held at Helsinki in August 1966. Report of the Committee on the Uses of the Waters of International Rivers, London, International Law Association (ILA). Disponível em http://www.internationalwaterlaw.org/IntlDocs/Helsinki_Rules.htm.

International Law Association (2004): The Berlin Rules on Water Resources. ILA Berlin Conference 2004. Available in <http://www.ila-hq.org/pdf/Water%20Resources/Final%20Report%202004.pdf>.

Luso Spanish Convention (1998): "Convention on Cooperation for the Protection and Sustainable Use of the Waters of the Luso-Spanish River Basins". In Vlachos, E. & Correia, F.N., coord. *Shared Water Systems and Transboundary Issues with Special Emphasis on the Iberian Peninsula*. Instituto Superior Técnico - Portugal, and Colorado State University - USA.

MMA (Ministerio del Medio Ambiente) (1998): *Libro blanco del agua en España*. Madrid.

Sereno, A.(2004): O princípio de uso equitativo: uma pedra no sapato da convenção Luso-Espanhola. Faculdade de Direito, Universidade Católica Portuguesa de Lisboa, Lisboa, 2004. http://www.us.es/ciberico/archivos_word/69b.doc

Serra, P. C. (1999): "The Defense of Portuguese Interests in the Agreement on Cooperation for the Protection and Sustainable Exploitation of the Waters of Luso-Spanish Catchment Areas". In Vlachos, E. & Correia, F.N., coord. *Shared Water Systems and Transboundary Issues with Special Emphasis on the Iberian Peninsula*. Lisbon, Luso-American Foundation, Instituto Superior Técnico - Portugal, and Colorado State University - USA.

Utton (1996): "Regional Cooperation: The Example of International Water Systems in the Twentieth Century". *Natural Resources Journal* Vol. 36 (Spring 1996): 151-154.

Vergés, J.C. (2000) "Les demandes d'eau en Catalogne dans la région Catalane desservie par ATLL". In Barraqué, B., ed. (2000^a,b).

Vergés, J.C. (2000) "Impact of Water Pricing and Foreseen Impact of the CAP on the Use of Irrigation Water in Spain". In A. Massarutto, coord. *Water Pricing, the CAP and Irrigation Water Use*. EC DG XI, Brussels.

Vergés, J.C. (2001) The Alqueva Irrigation Agreement. In Portugal Case Study, INFU, LEI and WRc, European Commission Directorate General Research, Brussels.

Vergés, J.C. (2002) *El saqueo del agua en España*. Tempestad, Barcelona.

Vergés, J.C. (2004) "La cría del elefante blanco europeo en el Guadiana". In Adenex and Fundación Nueva Cultura del Agua, *Una nueva cultura del agua en el Guadiana*. Badajoz. Portuguese text (2005) "A criação do elefante branco europeu no rio Guadiana", In Seleção e Organização da APRIL, Antologia *Os poderes públicos, a convenção de Albufeira e a gestão da água em Portugal*. Porto, Março de 2005. Portuguese text online (2006b) disponível em <http://www.aguaonline.co.pt/pdfs/elefantebranco.pdf>.

Vergés, J.C. (2005) See Vergés 2004.

Vergés, J.C. (2006a) "Hacia un mercado libre del agua" in Regulación, *desregulación, liberalización y competencia*, Fundación Rafael del Pino, Madrid.

Vergés, J.C. (2006b) See Vergés 2004.

Water Framework Directive (2000). Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.