Landscapes, Water Policy and the Evolution of Discourses on Hydropower in Spain

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Abstract

The paper explores the institutional and social processes through which river and hydropower landscapes have emerged in Spanish water policy. It examines the relation between different types of policies and attitudes towards landscape, energy, water, environment and land use in the production of Spanish landscapes. The article presents examples at both national and regional levels to explain that the institutional emergence of the river landscape in Spain has been closely related to the democratization and decentralization of Spanish politics and water policy and to the increasing prominence of environmental concerns.

Keywords: Hydropower, Landscape, Politics, Water Policy, Spain.

1. Introduction

Although some slight concerns for landscape issues have been manifested in Spanish environmental and other laws during the last quarter of the 20th century (Fernández, 2007; Frolova et al., 2003), landscape only became an integral part of Spanish land-use planning since 2000, when Spain signed the European Landscape Convention. That same year, the European Union (EU) announced its new water policy in the 2000 Water Framework Directive (WFD) which placed strong emphasis on the integral water management of river basins. From this moment on, a landscape which had hitherto earned only a marginal position in political and scientific texts on water management became the subject of increasing interest in Spain.

The landscapes "emerging" from the development of renewable energy have also become an important point of discussion in many European countries, since the European Union initiated a process of energy policy reform in order to reduce greenhouse gas emissions in the context of climate change. Renewable energy should account for 20 percent of global electricity generation of the EU in 2020. In Spain, the National Renewable Energies Plan 2005-2010 seeks to increase electricity generation based on renewables to 21 percent (102,259 GWh) of national electricity. More then 37 percent of the power feeding the Spanish grid (38,186 GWh) will be provided by hydropower (IDAE, 2006).

Although the social tensions surrounding the development of hydropower have been analysed in previous social and geographical studies of the acceptability of renewable energy (McCully, 1996), the topic of the perception of landscape transformations caused by hydropower has been a somewhat marginal aspect of landscape study. This could be due to the fact that this topic only began to be discussed in European policy programs in the last quarter of the 20th century, when most of the accessible sites for large dams had already been developed (Getches, 2003), at least in Europe and in the USA. In addition, in Spain, up until recently hydraulic dams had strong government backing.

Landscape concerns, in a social and cultural sense, were practically absent from official and academic writings on hydropower in Spain until the 2000's. Evocations of such concerns were most often limited to the perception of dams as a beautiful landscape for recreational activities (MMA, 2006; Flores, 2004;

Segura, 2004), notwithstanding the negative effects dams might have on the landscape. Apart from references to archetypal "attitudes" to landscape in some works on water policy (del Moral et al., 2003; Saurí and del Moral, 2001; Swyngedouw, 1999), fluvial landscapes (Ureña and Ollero, 2001) and stakeholders' perceptions of desertification (Oñate and Peco, 2004), the perception of the impact of hydropower on landscape has not been subjected to detailed analysis in Spain. Most often, these attitudes are characterized through the contrast between the very positive image of "tamed" water and the perception of the "wild" river as a hostile, uncertain and threatening force.

The aim of this paper is to explore some of the key aspects of the evolution of the relationship between landscape, hydropower and water policy in Spain. Even though hydropower alone did not shape Spanish landscape at the national level and was not as important for its evolution as water management policy, it did become an essential element of the Northern and Central river basins, which include the three main rivers of the Iberian Peninsula, the Duero, the Tajo and the Ebro. They contain about 76 percent of the water resources, but only 45 percent of the total Spanish population (del Moral and Saurí, 1999). Similar imbalances exist in the distribution of hydropower plants: the need for large amounts of water and a sufficient drop for harnessing hydropower led to hydropower plants being concentrated in the mountain regions of Spain, especially along the north coast and in the Pyrenees. The result today is that the Northern and Central river basins produce about 90 percent of Spain's hydropower (Segura, 2004).

My basic premise is that the discourses on hydropower in Spain had been dominated, up until the 1990's, by a generally positive public perception of traditional water policy, especially at the policy-makers level, and that there had been very little questioning of the real impact of hydropower infrastructures on river landscapes. But from the 1990's onwards the general perception of hydropower impact on river landscapes has been changing due to growing public participation in water policy which had hitherto only had a very limited role in the formal decision-making process on the Spanish river landscape planning. In the Northern and Central river basins, a new sensitivity towards landscape questions has become one of the main barriers to further development of hydropower.

2. Context of the study

The perception of the hydropower landscape in Spain is intimately related to the public acceptability of water policy and water management. Water has always been an important issue in Spain and from the turn of the 19th century onwards became a prime consideration in national political, socioeconomic and cultural debates (Swyngedouw, 1999; del Moral, 1998). According to some recent approaches to landscape (Olwig, 2002), Spanish landscape can be considered a social, institutional and political process, that is constantly changing and dynamic. The construction of the modern Euro-American state and polity was accomplished through the usurpation and transformation of landscape (Olwig, 2002; Mitchell, 2003). In this sense, the evolution of Spanish landscape throughout the 20th century reflects the interests and ambitions of Spain's governing social and political classes, often directly implemented through water management policy. The recent evolution of Spain's landscape cannot be understood without explicit reference to the changing role of water in Spanish society (Swyngedouw, 1999). Water management in Spain became a deeply geographical project in which the intertwined transformations of nature and society were both mediums of expression of shifting power positions that were materialized in the production of new water flows and the construction of new waterscapes (*Idem.*). In the 20th century hydropower landscapes became an important part of these waterscapes.

There are, therefore, several specific difficulties inherent in studying the relationship between landscape and hydropower in Spain. On the one hand, the analysis of the relationship between landscape, social acceptability of hydropower and public policies should take into account the implications and superposition of different policies and attitudes towards landscape, energy, water, environment and land use, and on the other, the wide variety of uses to which water is put, especially in Spain where the use of water for energy generation is just one of many often competing, simultaneous uses of water (Molina and Montiel, 1999). In addition, the evolution of landscape and the social perception of its transformation by hydropower infrastructures cannot be understood without first analysing the social significance of traditional Spanish water policy and its impact on the riverscape.

The paper explores the institutional and social processes through which river and hydropower landscapes have emerged in Spanish water policy. I have examined these processes on different political and geographical scales, and compared the different trajectories at national and regional levels. Hydropower landscapes cannot be considered in isolation from other waterscapes. The hydropower landscape, like

Spain's other water landscapes, could be considered a "political landscape" to the extent that it was a challenge for the official policy of economic transformation of Spain. Up until quite recently this landscape reflected the interests of central state authority and civil servants rather than the interests of the population as a whole or of local people directly affected by landscape changes.

Our sources include both secondary literature and direct documentary information on hydropower and water management development in Spain since the 1980s, policy documents and the opinions of stakeholders (writings by political, academic and environmental groups). The study of regional examples is restricted to analyses of policy documents and of the views of regional stakeholders (environmental, nature protection and landscape preservation organisations, anti-hydropower groups and academic groups) published between 1990 and 2008.

I will begin by reconstructing the process of hydropower development in Spain and the origin of the traditional *paradigma hidraulico* (water management paradigm) - a state-based water regulation system "*with the ultimate objective of ensuring the availability of cheap water to permit economic growth*" (Saurí and del Moral, 2001: 351) - which has dominated Spain's water policy since the end of the 19th century (Part 3 and 4). This form of water management was provided by a system made up of large, modern infrastructures based on water reservoirs, dams for generating hydroelectricity and networks of irrigation channels. The *paradigma hidraulico* embodied an instrumental attitude to water and had a direct effect on the perception of hydropower landscapes.

Secondly, through the national and regional examples I will examine how the changes in the discourses on hydropower and the emergence in Spain of river landscape as a subject of interest at an institutional level have been closely related to the democratization and decentralization of Spanish politics and water policy and to the increasing prominence of environmental and landscape concerns (Part 5 and 6). The evolution of discourses on hydropower is considered at different political-geographical levels, and the different processes of development of water, hydropower and landscapes are analysed at national and regional levels.

3. Spanish hydropower development: the absence of river landscape

Hydropower generation is one of the main uses of water in Spain, together with irrigation and domestic supply. Hydropower once played a leading role in electricity generation. In 1940 about 92 percent of all Spanish electricity (3617 GWh) came from hydropower and in 1975 this figure was still as high as 80 percent. Since then the relative contribution of hydropower to Spain's overall electricity supply has declined sharply, due to the increasing importance of fossil fuel and nuclear power plants, although in absolute terms hydropower generation continued to increase until the early 2000's. In 2006, only about 9.7 percent of Spain's electricity came from hydropower (IDAE, 2006). In spite of this decrease in the beginning of the 21st century, the country still had twenty five large dams under construction and has one of the largest numbers of hydropower plants in the world. The country has an important network of more than 1200 large dams with a capacity of over 56,000 hm^3 (MMA, 2006). It also holds the world record as the country with the largest proportion of its geographical area occupied by man-made reservoirs (Naredo, 1999). Its ratio of large dams to population, which in 2006 was about one large dam for each 36,917 people, is the highest in Europe. Most of Spain's large dams were built before the introduction of the concept of Environmental Impact Assessment into Spanish legislation in 1986. Thus, hydropower projects were carried out with little or no attention to the possible environmental and social consequences and with no regard whatsoever for river landscape. The water system and fluvial landscapes have simply been adapted to new spatial developments, such as infrastructure, industry, agriculture, etc.

The impacts of hydropower plants on fluvial landscapes involve different geographical scales and affect diverse landscape elements. Hydropower is considered more environmentally friendly than, for example, fossil fuel or nuclear-based energies. It is well known that electricity generation based on hydropower has much lower CO_2 emissions (in temperate regions this emissions are equivalent to about 3-4 t CO_2 per GWh) than oil or coal-fired power plants (850 and 990 t CO_2 /GWh, respectively) (Bratrich et al., 2004). In addition, the decommissioning of hydropower plants is simpler than that of nuclear power plants and no hazardous waste is generated. Finally, many hydropower schemes are used not only for power generation but also for flood management, irrigation, or drinking water supply.

Nonetheless, the negative impact of hydropower infrastructures on fluvial landscapes is very serious and has been extensively documented (e.g., González and García, 2007; Bratrich et al., 2004; Friedl and Wüest, 2002; Pringle, 2001; Graf, 2001). Hydropower dams modify natural hydrologic regimes, act as

barriers to fish migration, trap nutrients or sediments, dry up floodplains, and divide habitats. The river flow fluctuation caused by hydropower plants results in dramatic changes in downstream ecosystems (González and García, 2007) and sometimes in the landscapes of entire river basins. The inundation of areas traditionally used for agriculture, the massive displacement of people and the loss of valuable cultural landscape features are other common landscape impacts of dams. Hydropower therefore affects much larger tracts of land than most other types of energy and causes much more profound changes to the landscape than other renewables. This is why, in accordance with the European Commission's White Paper on renewable energy of 1997, in Spain only hydropower based on small and mini plants is considered as "clean energy" (Royal Decree 2818/1998).

Paradoxically, although Spanish "riverscapes" have been radically transformed by water infrastructures, there were no references to the social and cultural values of fluvial landscape in institutional and academic writings up until the 1990's. This could be explained by the predominance in Spain of the technocratic, infrastructural approach to water management, which also characterized water policy in a number of other countries such as the USA (Getches, 2003; Graf, 2001; Schmidt and Plaut, 1995), the Netherlands (Wolsink, 2006), Israel (Maruani and Amit-Cohen, 2009; Feitelson, 1996; Schmidt and Plaut, 1995) and some developing countries (Faggi, 1996), although the Spanish water management paradigm and its influence on the spatial planning in this country had certain singularities that were shaped by Spain's particular political and socioeconomic history. The engineering-based, "command-and-control" approach was predominant in Spain in the 20th century, as a consequence of a large set of historical, economic, social and cultural factors: influence of the ideas of the "regeneration-through-modernization" movement, the Franco dictatorship, the privileged position of certain social groups or lobbies (the road, canal and port engineers, the main agricultural organisations, the building companies, the power supply companies and the public bodies responsible for water management) in the decision-making process on water management and land use.

4. The varying fortunes of Spain's water management paradigm

The evolution of Spanish landscape, its current configuration and the perception by different parts of society of its transformation by hydropower infrastructures cannot be understood without taking into

consideration the social significance of the impact on the riverscape of the traditional Spanish water management paradigm, known as the "*paradigma hidraulico*" (del Moral and Saurí, 1999; Saurí and del Moral, 2001).

The origin of the "*paradigma hidraulico*" dates back to the end of the 19th century. It is closely related to an intellectual movement known as *Regeneracionismo* (Regenerationism), which emerged in Spain at the turn of the 19th century. Its main thesis held that the development of Spain required a project for the geographical transformation or regeneration of the country by human action based on geographical knowledge, technology and collective will (Naredo, 1997; Ortega, 1992; Fernández, 1989a,b; Gómez and Ortega, 1987).

The discourse of the regenerationists began to take practical form in the late 1920's, and was appropriated by some social groups or lobbies under Franco's dictatorship (Swyngedouw, 1999). In 1926 during the dictatorship of Primo de Rivera (1923-1930) the Spanish Government set up what were known as the *Confederaciones Hidrográficas* (River Boards) to manage water resources in the different natural hydrological basins. Each Board was named after the river basin for which it was responsible and its powers often flowed over various provincial boundaries. They had certain political status with participation from the state, banks, chambers of commerce, provincial authorities, etc. and operated with functional and statutory autonomy.

The water policy based on the *paradigma hidráulico* became especially important in Spain in the 1940's, when irrigation development became a means to create an expanding class of small farmers without jeopardizing the interests of large landowners, the main supporters of Franco's military uprising in 1936 (Saurí and del Moral, 2001). The Franco regime deprived them of their autonomous status and converted them into government bodies whose function was to plan, execute and operate public water works as an instrument of and directly dependant upon central power.

As a result, any modernising political programme in Spain had to address the need to improve social welfare by developing modern water infrastructures. The complex process of modernization brought on by the water management policy shaped and transformed the Spanish landscape. There is no river basin, hydrological cycle, or water flow in Spain which has not been subjected to some form of social and

natural change (Swyngedow, 1999). Thus, Spain's modernization became, and remained even at the end of the 20th century, a geographical process with inevitable implications for landscape. The hydropower landscape and indeed all other Spanish water landscapes have become "political landscapes" to the extent that both hydropower and water policies, associated with the idea of progress of the Spanish "Nation" and with the related landscape transformation, have all become part of the official political discourse.

The water management paradigm showed no consideration for the ecological, cultural, aesthetic and emotional dimensions of water. It epitomized an instrumental approach to natural resources based exclusively on figures: water deficits, water surpluses, geographical imbalances, supply and demand figures and projections (Saurí and del Moral, 2001).

After Franco's death in 1975, the country underwent a dual economic, political and social transition to democracy and decentralisation. The Spanish Constitution of 1978 established a system of decentralised government and shared power between the central and regional governments or autonomous regions (*Comunidades Autónomas*). The Constitution gave the State the power to legislate environmental issues, but, according to the principle of subsidiarity, the autonomous regions could pass additional laws that would apply within their own boundaries. At the same time, the Spanish government started to dismantle the public-owned water and energy sectors in line with the neo-liberal trend in vogue in Western countries, especially after Spain became a full member of the EU in 1986. Nevertheless, while it had been possible to manage water, according to the traditional "*paradigma hidráulico*" before the 1980's when Spanish institutions were fully centralized, it became impossible for central policy makers to do so in the new decentralized Spain, due to rising conflicts between national and regional interests.

The strengthening of some central functions of water policy, which could be referred to as re-centralization, became salient in the basic Spanish Water Law passed in 1985 which was based on a natural hydrological basin approach to managing the water system. Most importantly, this law gave the National Government considerable power over water resources by changing the status of the River Boards (*Confederaciones Hidrográficas*), and making them part of the Ministry of Public Works and Town Planning (Article 19). The law also proposed a single national instrument for water planning. It took shape in the National Hydrological Plan under which the different River Boards had to design their respective Hydrological Plans at a basin level in conformity with the National Plan. The 1985 Water Law

relied on basin-based planning to resolve conflicts between national and regional interests, especially in the case of rivers flowing through several different autonomous regions (Article 21). It also acknowledged for the first time the needs of water ecosystems and the environmental and socio-economic impacts of water development (Getches, 2003).

Recentralization remained the major outcome of these successive changes to the point that any policies affecting water use which were approved by the different national and regional ministries were subordinated to the centralized Hydrological Plans. As del Moral put it (2000), there had been a long-standing tradition of centralized water management with solid institutions and a well-established administrative framework, which gave unquestioned legal backing to centralized water policy. For almost a century the centralized water policy had been presented as the only correct policy for the country to follow and it played an important role in the legitimization of the State (del Moral et al., 2003).

Important tensions have developed between the recentralization of water policy and the decentralization of the Spanish State, characterized by an increasingly dominant role of the autonomous regions. These tensions were manifested in a "regional opposition" to centralized water policy (Saurí and del Moral, 2001). The water from the biggest Spanish river basins (Tajo, Duero and Ebro), which is of fundamental importance for hydropower, is jointly managed by different regions and has been the source of a number of important social conflicts. The traditional water and hydropower management paradigm was based on the principle of "national solidarity", which consisted of the regions with most water and hydropower sharing it with those in need. Since important powers were transferred to the autonomous regions, those regions traditionally considered to have abundant water and hydropower supplies are no longer prepared to share "water/hydropower surpluses" with others and instead choose to redistribute them within their own regions. Some examples of the new "regional solidarity" could be observed as early as in 1992 with the approval of the so-called 1992 "Water Pact" of Aragon, analyzed by Saurí and del Moral (2001). In this Pact, all of Aragon's political parties agreed to oppose the transfer of water from the River Ebro to other basins until the needs of Aragon were fully satisfied. Only the regions traditionally considered to have abundant water resources have expressed their radical opposition to inter-basin water transfers, while those in need (like Valencia and Murcia) have always been in favour of these projects.

The relationship between the decentralized system of land-use planning and the recentralized water policy is also an important example of the complex relationship between decentralization and recentralization. Since 1991, land-use development in Spain has been the exclusive responsibility and an essential part of regional government action. Under Spain's land-use planning and water management systems, land-use control over fluvial areas should be undertaken by two public bodies: by Town or City Councils which approve the local land-use plans, and by the River Boards within their water management domains, approved in their Hydrological Plans (Ureña and Ollero, 2001). However, in practice it is the National Hydrological Plan that establishes conditions for territorial organisation and future water uses within each river basin. It also lays down criteria as to the compatibility of different water uses and can classify sectors of river basin as protected areas (Bernabent, 2006). As most regional land-use plans had first to conform to the National Hydrological Plan, this did not encourage local councils that were part of the same catchment area to develop an integrated approach to river management (Ureña and Ollero, 2001). The result was that they ended up dealing only with infrastructures for water supply and sanitation in urban areas.

The attempts to adapt water policy to the new context (decentralization, market economy, rise of environmental concerns) were not very successful. In 1996, the River Boards were transferred to the newly created Ministry of Environment but this had no visible effects on water management (Oñate and Peco, 2005). The state strategy of water management consisted of responding to the recurrent mismatch between supply and demand of both electricity and water by constantly increasing hydropower capacity and water supply (Barraqué, 1995). The traditional water management paradigm, which insisted on increasing water supply and hydropower development, still impinged on attitudes to water and energy policies, at least at an official level. The increasing need for inter-basin transfers was one symptom of the inefficiency of this approach. The following documents illustrate the continued importance of the water management paradigm in recent times in Spain:

- Article 60 of Title III of the 1985 Water Law emphasized the importance of further Spanish hydropower development and made industrial use of water for hydropower an important priority, third only to water supply for the population and water use for irrigation and other agrarian uses.
- The Hydrological Plans for most of the Spanish river basins approved in 1998. These plans proposed increasing hydropower generation not only in northern and central Spain where water

resources are more abundant, but also in the southern rivers (the basins of the Segura, the "Cuenca Sur", the "Guadalete-Barbete", the "Guadiana I", etc.), which have limited water resources, especially in summer due to the overuse of water for irrigation (Molina and Montiel, 1999). These Hydrological Plans show little or no concern for the landscapes they affect.

- The National Hydrological Plan of 2001, approved without any real public participation process, authorized large inter-basin water transfers from the Ebro River to the arid Mediterranean coast, and plans to erect 120 dams. It also insisted on the further development of hydropower plants.
- As recently as 2006, in the official website of the Ministry of Environment of Spain and different official documents on the development of dams and water reservoirs, it was underlined that dams are a driving force for the Spanish economy, especially for irrigation, domestic supply and hydropower (MMA, 2006).

Another sign of the persistence of the traditional "paradigma hidráulico" is the positive perception of water reservoirs as artificial "lakes" with a high natural and landscape value. This perception was generalised in the "official" documents on dams and water reservoirs published by the Spanish Ministry for the Environment (MMA, 1996), the Urban Planning administration and the regional River Boards (Flores, 2004, DGU, 1991). It was also present in political speeches and in some academic works (Móniz, 2000). Several influential stakeholders in this field such as members of the Spanish irrigation and agricultural associations and of the power supply companies asserted that dams and water reservoirs were not only harmless for natural landscapes, but also have high natural and landscape values in their own right (del Moral, 2000).

5. The emergence of the "new water culture"(since the 1990's)

The concerns of fluvial landscape, in a social and cultural sense, were almost absent from institutional and academic writing in Spain until the 2000's. Only in recent years has an increasing awareness of landscape issues entered the water management debate at the national level (Arrojo Agudo, 2004). The radical transformation of the Spanish landscape due to water management policy and the intensive economic development after the liberalization of the economy in 1959 led to some growth in the social valuation of natural landscapes during the last quarter of the 20th century. At the same time the notion of landscape gradually began to find a place in national conservation laws. The Law of Nature Conservation of 1989 established for the first time the concept of a "protected landscape" (art.17). In addition, since 1985 onwards, the concept of Environmental Impact Assessment (EIA) has gradually been introduced

into Spanish Laws[1], where it set out important principles such as: prevention, environmental impact assessment, public information, social participation and environmental education. However, this legislative evolution has had little practical effect on the protection of fluvial landscapes from the impacts of dam projects. From 1986 until the early 2000s, only 9 of the 130 dam projects subjected to EIA were rejected.

River restoration ideas have been commonplace since the seventies in the academic arena and among environmental activists in many European countries, where water management systems have had to be adapted to respond to new environmental concerns (Wolsink, 2006; Adams et al., 2004; Bratrich et al., 2004; Falkenmark, 2004; Rosillon, 2004; De Ureña, 1999). The National Wild and Scenic Rivers System was created by the US Congress (Public Law 90-542; 16 U.S.C. 1271 et seq.) as early as 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. During the 1970's and 1980's numerous studies on the effects of human activities on river flow and fluvial ecosystems in the USA, Canada, Australia and some European countries (for a review, see Petts, 1984; Brookes, 1988) emphasized the importance of the ecological management of rivers. In the 1990's the interest in river conservation and restoration extended to different scientific and technological fields (Boon et al., 2000). At the same time environmental organisations and ecologists stressed the importance of pristine river systems with high biodiversity and aesthetic values. In 1995 the European Centre for River Restoration (ECRR) was established in Silkeborg (Denmark), which supported and promoted river restoration and sustainable river management throughout Europe. Countries like France (Dupuis-Tate and Fischesser, 2003), Belgium (Rosillon, 2004), the United Kingdom (Adams et al., 2004), etc. developed different programs for riparian landscape protection and sustainable management. Despite an increasing awareness of environmental issues and a greater appreciation of river landscape in Europe, in Spain the attention accorded by the water management institutions to the natural, social and cultural values of fluvial systems remained quite low until the 2000's (González and García, 2007; Ureña and Ollero, 2001; Ibero, 1996).

The key steps in the institutional emergence of Spain's "river landscape" are summarized in Table 1. This chronological synthesis shows how had a powerful critic of the water management paradigm influenced on the institutional emergence of the river landscape.

(insert table 1 around here)

As happened in other countries with floods (Wolsink, 2006; Pottier et al., 2005; Howe and White, 2004), natural disasters have contributed to a paradigm shift. The devastating droughts of 1991-1995 catalysed some important social conflicts which accelerated the crisis in the Spanish water management system (Castillo, 2006). The conflicts emerged initially at the level of social movements, and later at the level of state institutions.

In 1995, an association called *COAGRET* was founded by Pedro Arrojo Agudo, an economics professor at the University of Zaragoza, to unite those affected by large dams and water transfer projects (see: www.coagret.com). The construction of large dams has become a socially and environmentally conflictive issue, because of their effects on other water uses within the same river system and their repercussions on local society. Opponents of hydropower insisted on its environmental and economic limitations in Spain. They claimed that the traditional water management attitude was not realistic, because it led to an irrational use of waters that was detrimental to Spain's Mediterranean hydrological system (Iranzo and Izquierdo, 1997).

In 1998 the *Fundación Nueva Cultura del Agua* (Foundation for a New Culture of Water (FNCW), see: www.unizar.es/fnca) and the non-profit-making Iberian Congress on Water Planning and Management were created by a group of Spanish and Portuguese academics (Pedro Arrojo Agudo, Javier Martínez, José Manuel Naredo et al.) in an attempt to build bridges between the scientific community and an outraged public to pressure the government to abandon the failed water management policies of damming and diverting. This conservation movement, perhaps the first of its kind in Europe, has been swiftly reframing the debate over water management in favour of sustainability and against dams.

Numerous books, articles and lectures critical of Spain's water policy have been published by the members of this foundation (Arrojo, 2001; Arrojo and Naredo, 1997; Beaumont et al., 1997; Martínez, 1997). In addition, recent water conflicts demonstrate that social participation in environmental policy is broadening, as shown by the following examples (Cf. Table 1): the public protests and demonstrations against the construction and subsequent maintenance of the Itóiz dam (Irati river, Ebro basin, 1999 onwards); the outcry against the project for the enlargement of the Yesa dam (River Aragon, Ebro basin,

1999 onwards) and against the project for a dam on the River Caliao (River Caliao, Northern River Board, 1999 onwards), both approved by the Hydrological Plans of the respective River Boards.

In 2001, the approval of a National Hydrological Plan authorizing large inter-basin water transfers from the Ebro River, without any public consultation, triggered social tensions. The FNCW mobilized hundreds of thousands of citizens, including politicians and trade unionists, in protests against the National Hydrological Plan in Barcelona, Madrid, Valencia, etc. The protest of Barcelona of 2002, which mobilized about 400,000 people, was one of the largest demonstrations ever seen in Spain since its transition to democracy. These campaigns, together with pressure from the European Union, led to the shelving of the project immediately after the *PSOE* (the Spanish socialist party) came to power in 2004.

In this way the regional stakeholders have demonstrated that they are no longer prepared to accept that degraded water environments are an unavoidable consequence of technical progress and have demonstrated to the central power that it cannot carve out the Spanish river landscape without taking into account the interests of its inhabitants.

The "*paradigma hidráulico*" ended up being criticized not only for its negative impact on stream flows and downstream riparian vegetation, but also for its ineffectiveness as an energy policy. The following new arguments were raised against hydropower by environmental and academic groups, especially since Spain began implementing European policy on renewable energy:

- Hydropower cannot solve Spain's energy problems, especially because of the seasonal and annual fluctuations in its supply rates. This argument became especially clear after a severe drought in 2005, when hydropower generation fell by 35.6 percent. After this drought the Spanish administration realized that the hydropower plants in some southern and central regions did not provide a reliable solution for energy problems. It was therefore proposed to complement them with other types of energy which would compensate for the fall in electricity production during the summer and during "dry" years.
- The power supply sector is heavily subsidized with public money and is very inefficient. At present, Spanish energy policy, in a similar fashion to Spanish water policy, is based on constantly increasing rates of consumption which are perceived by many in society (Flores, 2006; MMA, 2006; Marcos, 2006) as a synonym of development. As there is no attempt to achieve efficient energy consumption, the opponents of hydropower believe that an increase in the

number of energy generators (including those based on renewables) will not solve the country's energy problems.

The Spain's Plan for Renewable Energy (PER 2005-2006) proposed that certain abandoned water infrastructures (normally small hydropower plants) should be "reactivadas" (restored?), as an "energy diversification option" (MITC and IDEA, 2005). Though the energy produced by these hydropower plants are considered to be "the less aggressive with environment then other renewable energies" (Idem., p. 84) and beneficial to the country's historical landscapes, if they are classified as "industrial or hydraulic heritage"[2], its restoration have however been opposed by some local environmental, academic and even some political groups in regions such as Galicia and Navarre where these plants abound, because of the damage they cause to fluvial ecosystems and landscapes.

5. The recent institutional recognition of "river landscape" (2004-2009): Toward a new paradigm?

New concerns for river landscapes have entered both water and energy policies in Spain as a result of developments at the European level. For instance, the application of the 2000 European Landscape Convention (ELC) encouraged several autonomous regions to incorporate landscape as an important issue in land use regulation[3]. In the same way, the Water Framework Directive (WFD) adopted in 2000 by the European Parliament set up a framework for action in the field of water policy. Among other concerns, it seeks "*to protect aquatic ecosystems, and the terrestrial ecosystems and wetlands directly dependent on them*" (Directive 2000/60/EC, paragraph 23) and to prevent them from further deterioration (idem, article 1). It also requires the mandatory implementation of the catchment basin approach in all member States.

The 2001 National Hydrological Plan was supposed to implement the WFD; it invoked the principles of sustainability, sound economics and ecological preservation that pervade the Directive, to be achieved through a water plan that results in good ecological status and requires ecological flows and other protection (Getches, 2003). However, in chapter 3 it authorized four large inter-basin transfers of water from the Ebro River, which shows that this Plan used the words "sustainability" and "ecological preservation" as rhetorical tools but did not implement its principles.

The transformation of Spain from a very centralized to a quasi-federal state composed of regions with legislative and executive powers has also accentuated water landscape concerns. The recent regional discourses on water are based on a new approach to rivers and water. These are no longer perceived merely as resources for development, but are viewed as assets that belong to the region.

In the early 1980's the newly created Autonomous Regions began to take up their legislative and executive powers. According to the Constitution of 1978, powers which are not considered to be the exclusive domain of the central government can be assumed by regional autonomous governments, if they are established in their Statute of Autonomy (*Estatuto de autonomía*). Among these powers the Constitution names: land-use planning and related policies; environmental management; projects of hydraulic infrastructures of interest to the Autonomous Region, etc. (Article 148). Some of Spain's Autonomous Regions like Catalonia, Pais Vasco, Galicia and Andalusia were granted greater powers than other regions due to their special status as "historical nationalities".

A striking example of the institutional emergence of the landscape dimension of rivers and of the new "regional solidarity" is the case of the Galicia Autonomous Region which in 2006 passed the Law for the protection, conservation and improvement of the rivers (BOE, 2006). Galicia, which is situated in the north-east corner of the Iberian peninsular, has 2.78 million inhabitants (2008) and occupies an area of 29,574 km^2. Since 1981 the Galicia regional administration has assumed a series of legislative powers of which the following are of interest for this paper:

- Land-use planning and related policies;
- Projects, construction and exploitation of water infrastructures within the region's boundaries;
- Installation of electricity production, distribution and transport systems, providing that the electricity is not transported outside the region and its use does not affect other provinces or autonomous regions.

Yet the State still has considerable power over water resources through the River Board and its Hydrological Plan. According to the Article 149 of the Constitution of 1978, the State is responsible for legislation, planning and "rights over water systems and resources", if rivers flow through more then one autonomous region, and the authorisation of electricity installations, if their use affects another region or its transport goes beyond the boundaries of the particular autonomous region.

A new sensitivity towards natural, social and cultural values of river landscape emerged in Galicia, a region strongly affected by hydropower infrastructures, and inspired an intense social debate which in 2006 led to the passing of this "River" Law, the first one of its kind in Spain.

Rivers are an essential part of the identity of Galicia. It has about 10,000 rivers and is often referred to as "O País dos ríos" ("country of rivers"). As a result, Galicia is also one of Spain's main producers of hydropower. In 2008 it had 40 large hydropower plants (with an output of more then 10 megawatts) and about 110 small ones (with an output of 10 megawatts or less) (INEGA, 2008).

The Hydrological Plan of Galicia, which aimed to erect more than 100 hydropower dams, was proposed and approved in 2003 provoking an intense social debate that mobilized thousands of people to protest. Various Galician ecological groups and residents associations had been campaigning together for action to be taken to protect the region's rivers. About twenty non-governmental local, national and international organizations (including the FNCW) led the movement against the construction of new dams. The most important of these campaigns were called "A Country of Rivers" (O País dos ríos) and "Too many Watts, too many Dams and too few Living Rivers" (Sobran Watios, Faltan Ríos Vivos, Sobran Presas). Numerous articles on the subject were published in the press and in academic journals[4]. This helped to create a public understanding of the environmental impact of hydropower plants on local rivers. In summer 2004 a draft version of the River Law was drawn up with the support of 39,000 citizens (Martínez and Soto, 2006). The Law was passed in 2006 and some of the measures have already been put into practice with over 30 hydroelectric projects being put on hold.

This Law presents negative landscape and ecological impact as an important argument against the construction or the restoration of hydropower plants. "Regional solidarity" within Galicia is a major claim. The law insists on the fact that Galicia generates 25 percent of Spain hydropower while having only 7 percent of its population and about 5 percent of its territory. It also mentions that 34 percent of Galicia's energy goes out of the region, "*losing in transportation an amount of electricity equivalent to all the electricity generated by wind power in Galicia*" (*Idem*: 30731).

It is the first Spanish law to establish a direct relationship between hydropower infrastructures and the degradation of river landscape. The Law declares that hydropower infrastructures are responsible for the

ecological degradation of Galicia's rivers. The environmental issues at stake, combined with the perception of hydropower infrastructures as being imposed by the central government and of little benefit to the local population of Galicia, created a feeling of geographical and regional identity, as has happened in other environmental disputes (Wolsink, 2006; Dalby and Mackenzie, 1997). In this way, the institutional emergence of "river landscape" can be interpreted as a way for Spanish regions to gain power over "their own water". This is happening at a time when the traditional water paradigm is being contested at its core, that is, as an energy policy, and when the European Union provides a framework for the development of landscape legislation and the implementation of alternative energies in different European regions.

The law considers that there is an urgent need to protect river landscapes, which *"play a transcendental role in the traditional economy and the conformation of the socio-cultural and psychological characteristics of the Galician people* […]" (BOE, 2006: 30731). The part of this document that recognizes the important role of rivers in the lives and identity of the people of Galicia is congruent with the ideas of Pedro Arrojo on the important issues to be put forward by the FNCW (Arrojo Agudo, 2004). He was one of the first people to establish the direct relationship between the ELC and the WFD and he believed that the struggle for the recovery of the traditional recreational, aesthetic and symbolic value of waterscapes was a key task for this foundation. Recognition of landscape as "*an essential component of people's surroundings, an expression of the diversity of their shared cultural and natural heritage, and a foundation of their identity*" in the ELC (Chapter II, Art. 5)[5] was for him an important institutional base for the new paradigm of water management (Arrojo Agudo, 2004: 30):

The idea that landscape is an essential part of individual and social wellbeing; the reference to the natural and historic causality of landscape urges us to reject treatments that seek only to paper over the cracks, acknowledging the factors that have made certain forms of the territory possible, and the application of the provisions on landscape protection, management and planning of the ELC to water landscapes, one of the most vulnerable and endangered areas, given the aspirations of the people affected,... confirm the ideas that we defend.

The Law for Landscape Protection of the Galicia Autonomous Region (7/2008) was passed in 2008. It will provide important legislative backing for river landscape concerns in Galicia.

Even though the “River” Law of Galicia is so far the only law which provides a framework for river landscape protection, the important change in Spain’s water management paradigm brought on by the FNCW is also manifested in other Spanish regions. The Ministry of the Environment, the Countryside and the Sea recently proposed the idea of the protection of River Landscape on stretches of rivers in which although there have been human-induced alterations, the socio-environmental and cultural values make protection and conservation necessary. So far 98 such protected river landscapes have been proposed in different parts of the country (CHEBR, 2008). In this way, the reviews of the different Hydrological Plans that have been carried out in all of Spain’s River Boards and will be approved in 2009 have to establish a strategy for river landscape protection that makes it an integral part of Spanish water management policy. The transparent planning processes (open to the public) undertaken recently by the River Boards for the new Hydrological Plans demonstrate that social participation in environmental policy is broadening.

7. Conclusions

Although there is consensus among experts on the need for integrated water management of river basins, the alliance between hydropower companies, irrigation communities, planners and civil servants in charge of water management and land-use planning, and political stakeholders, all of whom took advantage of the synergies between their particular interests and disregarded the complaints of the local population, contributed to the success of the traditional water management paradigm. On the other hand, the traditional separation between water, energy and landscape policies, water resource management and scientific communities results in a significant delay in the implementation of a system which would help to create a safe framework for human existence (Wolsink, 2006; Falfenmark, 2004; Getches, 2003; Graf, 2001). In Spain the social movements related to the New Water Culture which emerged in the 1990’s tried to overcome this separation and organized several successful mobilizations of different stakeholders. Numerous books and articles published in the press and in academic journals have also succeeded in pressurizing the government to amend its outmoded hydropower and water management policies. Spain’s national and regional administrations are now faced with a challenge to move away from their traditional instrumental use of water resources, which has no considerations for landscape to a policy in which river landscape values form an integral part.

For a long time, the perception of hydropower in Spain was strongly influenced by the water management paradigm. During repeated drought periods in the eighties, the early nineties and the hydrological year 2004/2005, important disputes over water use arose between different social groups and different geographical regions and the water distribution system was shown to be vulnerable (Riesco Chueca, 2003; del Moral and Saurí, 1999). As del Moral and Saurí demonstrated (1999), environmental degradation became a secondary problem for populations faced with water shortages for domestic or irrigation use and with losses in agricultural production. The idea that Spain was wasting river water by letting it to flow into the sea without any benefit for the Nation, became a recurrent feature in political discourses, just as it had been in the symbolic images conveyed by the 19th century "regenerationists".

Hydropower landscapes in Spain became "political landscapes", to the extent that hydropower policy associated with the idea of progress of the Spanish "Nation" and with the related landscape transformation, were all part of the official political discourse. Although the influence of the traditional water management paradigm still remains in some sectors of water policy in Spain (del Moral, 2006; Oñate and Peco, 2005), the relationships between water policy, energy policy and landscape issues have reached a turning point. This is a consequence of a set of factors including the democratization and the decentralization of the Spanish state, Spain's entry in the EU, the emergence of a new sensitivity towards river landscape and of new regional policies. Unlike many other European countries (Wolsink, 2006; Falkenmark, 2004; De Ureña, 1999), support for river landscape protection has only recently led to opposition to further development of hydropower. River landscape concerns are however becoming increasingly important in current approaches to water management and hydropower development.

The institutional emergence of "river landscape" in Spain is underway. The approval of Galicia's River Law is a sign that Spanish regions want power over their water resources and policy. However, as water flows through different regions, national coordination is still important. The failed attempt of the central power to bring flexibility to water policy leaves unanswered the question of how water management can be decentralized in Spain.

I would finally argue that the achievement of integrated water management of river basins in Spain depends on how successful the shift can be from the approaches based on the *paradigma hidráulico* to modern approaches including river landscape values which seem to be increasingly important to Spanish

people. As Keneth Olwig argues, the practice of the European Landscape Convention will hopefully help to reduce tensions between regulatory practices of territory governance that suit the uniform ideals of law, justice and society of a central state and an ideal of a just landscape ruled by decentralized conventions (Olwig, 2007). This observation can be useful to take account of the shift in Spain from a top-down centrally regulated river landscape to a "decentralized", "just" river landscape, which is congruent with the regional particularity, diversity, and cultural precedence of different Spanish regions. Broader public participation is a necessary condition for the achievement of this objective. As the process leading to the approval of the "River" Law of the Galicia region has demonstrated, public participation now involves groups and individuals that have hitherto only had a very limited role in the formal decision-making process on Spanish water and landscape planning. This is the only way to democratize hydropower landscape management, which up until recently has been imposed by central state authority and civil servants.

[1] By application of EC Directive 85/337/EEC, through National Legislative Decrees (1302/1986 and 1131/1988) and by Law 6/2001 and 9/2006 on EIA.
[2] All the Spain's River Boards have inventories of their hydraulic heritage in their web sites.
[3] Law for Land-use Planning and Landscape Protection of the Valencia Autonomous Region (4/2004), Law for Landscape Protection, Management and Planning of the Catalonia Autonomous Region (8/2005), Decree for the Landscape Regulation of the Valencia Autonomous Region (120/2006) and Law for Landscape Protection of the Galicia Autonomous Region (7/2008).
[4] Louzao, X., 1999. Doce enconos amenazan ao río Ulla. Revista Cerna 27; Soto, M., 1995. O impacto ecolóxico das minicentrais na Galiza. ADEGA-Cuadernos 1; FEG, Federación Ecologista Galega, 2000. Alegación ao plano de exportación hidráulica de Galicia. Revista Cerna 31.
[5] The ELC's approach to landscape as to a place constituted by changeable cultural perceptions and identities was explored by Keneth Olwig (Olwig, 2007).

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