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Challenges for a new water culture in the Mediterranean

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Summary. Along century XX the Spanish hydraulic policy has focused on hydraulic infrastructures to provide water mainly for irrigation and hydropower. This old hydraulic has significantly decreased the amount and quality of water resources, has damaged the aesthetic, environmental and cultural values of landscapes linked to water and threatens the long-term sustainability of the socio-economic activities. The presentation in year 2000 of a big water transfer from the Ebro basin to the Mediterranean Spanish coast initiated an unprecedented scientific, technical and social debate in Spain and by the sudden emergence of new actors in the water debate: people affected by hydraulic projects, citizen movements and green groups and a considerable part of the academic community. All these new actors demanded more public participation in the taking decision process and a greater consideration to the environmental, social and cultural issues of water and aquatic ecosystems. According to the European Declaration for a New Water Culture signed in Madrid in 2004, water uses should be prioritized according to the functions of water. Three levels of priority should be considered: Water for life; Water for general interest purposes and Water for economic growth.

Keywords. New water culture - Sustainable water management - Water conflicts - Water landscapes.

Défis pour une nouvelle culture de l'eau en Méditerranée

Résumé. *Le long du XXème siècle, la politique hydraulique espagnole s'est concentrée sur les infrastructures hydrauliques visant principalement à satisfaire les besoins d'irrigation et les besoins hydroélectriques. Cette approche a provoqué une réduction significative de la quantité et de la qualité des ressources en eau, portant atteinte aux valeurs esthétiques, environnementales et culturelles des paysages liés à l'eau et menaçant la durabilité à long terme des activités socio-économiques. En 2000, le grand transfert de l'eau du bassin de l'Ebre vers la côte méditerranéenne espagnole a suscité en Espagne un débat scientifique, technique et social sans précédent et a donné lieu à l'apparition soudaine de nouveaux acteurs sur la scène du débat concernant les ressources en eau : les personnes affectées par les projets hydrauliques, les mouvements de citoyens et les groupes des « Verts » ainsi qu'une proportion importante de la communauté académique. Tous ces nouveaux acteurs ont revendiqué une plus grande participation publique dans le processus de prise des décisions et une plus forte attention aux problèmes environnementaux, sociaux et culturels des écosystèmes hydriques et aquatiques. Suivant la Déclaration Européenne pour une Nouvelle Culture de l'Eau signée à Madrid en 2004, les usages de l'eau devraient être priorisés suivant les fonctions de l'eau. Il faudrait considérer trois niveaux de priorités : l'eau pour la vie ; l'eau au service d'objectifs d'intérêt général et l'eau au service de la croissance économique.*

Mots-clés. *Nouvelle culture de l'eau – Gestion durable de l'eau – Conflits pour l'eau – Paysages aquatiques.*

I - Mediterranean systems, water management and sustainability

Water plays multiple environmental, social and economic roles with complex relationships, some of which are not immediately evident. In addition to this functional complexity, its heterogeneous availability in space and time, both in terms of quality and quantity, complicates the matter. However, it is essential to understand and manage such complexity to maintain and protect the multiple roles of water (Burmil *et al.*, 1999; Lemly *et al.*, 2000). Water flows have multiple environmental functions which are essential for maintaining the health and productivity of both the ecological and socio-economic subsystems, including such less evident functions as the role of rivers in the maintenance of beaches and coastal fisheries. Therefore, it is required an innovative

and integrated approach, under which each possible management option and its implications for the overall system needs to be considered.

In the Mediterranean, the socio-economic systems have traditionally been attached to a careful management of water. The natural scarcity of water has limited the intensive exploitation of the land while, at the same time, has favored the existence of arid ecosystems with especially interesting biodiversity. Arid zones have developed traditional systems of water management highly sophisticated, with a demonstrated sustainability and well adapted to the natural conditions what, in turn, has promoted a rich water culture.

Water plays multiple environmental roles. Ecosystems dependent on water contribute to the maintenance of local and regional biodiversity and generates a high biological productivity with a key role in the trophic networks, especially in arid systems. Moreover, rivers and ephemeral channels constitute ecological corridors, enhance landscape values and contribute to the control and removal of diffuse pollution. There also very important cultural values of water and water landscapes, linked to the personal and collective identity and to the historical, archaeological and cultural heritage of societies, which should be preserved.

Hydrovorous economic activities, in particular intensive irrigation systems and a high urban and tourist development in coastal areas are being increasingly established in Mediterranean countries as Spain. With a Water Exploitation Index (Amount of water abstraction respect to renewable resources) of 33%, Spain is the third European country with a highest pressure on water resources, beside only two islands: Malta and Cyprus (EEA, 2003). Paradoxically, this pressure in Spain is highest in the most arid areas, such as the Segura basin, where in mid 90s irrigation consumed 228% of total renewable water resources, which means the highest pressure on water in the whole Mediterranean European countries (Institute for Prospective Technological Studies 1997). In the Segura basin, water consumption in irrigation greatly exceeds total renewable resources because additional water sources are used, particularly groundwater overexploitation (consumption of water reserves) and water transfer from other river basin.

In arid areas water resources are scarce but may exist important reserves of groundwater accumulated during long time. The intensive consumption of such no-renewable reserves allow for a certain period of time the support of water-intensive economic activities, such as irrigation and tourism. This leads to the misperceived assumption of that there are no critical limits to a permanent growth. However, the experience has shown that renewable water resources cannot always been substituted by means of a new technological intensification, due to the appearance of unexpected limits and environmental, social and economic side effects. This has been the case for long-distance water transfers (between different basins) which has revealed unsustainable social, environmental and economic costs, and for groundwater pumping at increasing depths, which faces important limits in terms of energetic costs and water quality due to salinization.

The unsustainable growth of irrigated lands and more recently the quick spread of big urban-tourist developments in many Mediterranean countries as Spain, along with the magnitude of the associated environmental effects, reveal an urgent need to adopt a systemic approach. The occupation of habitats of high ecological value, the loss of biodiversity, the aquifer over-exploitation, the loss of springs and wetlands and the increasing pollution of soils and waters, points to the existence of clear limits for the sustainability of these type of socio-economic activities. The limiting factors arise not only from the scarcity of water resources but also from the magnitude of environmental costs associated with these activities and the attached unsustainable water management.

II - A new approach for the concepts of water resources and water uses

The concept and quantification of available water resources, and hence the amount of water resources that can be assigned to and used by the socio-economic activities, does not constitute an independent variable. Instead, it is closely linked to considerations regarding the type of environmental, social and cultural water functions that should be maintained, to which current societies in Spain and Europe are showing an increasing sensibility. The recent reform of the Water Act in Spain has begun to acknowledge this, by establishing that water resources available for socio-economic uses have to be computed after water needs for environmental functions, such as environmental flows in rivers, have been quantified and discounted. This means a very important change of the concept of available water resources applied in Spain during the last 150 years, under the so-called old hydraulic policy and constitutes an important challenge for the actual water management.

Regarding water uses, the traditional differentiation among the categories urban, agricultural and industrial sectors is no longer useful in Spain, Europe and many Mediterranean countries, since such categories now includes very different situations which should be treated separately. In the case of urban water consumption, there is a wide gradient from basic survival to big-scale urban-tourist activities. In terms of water management, it is necessary, at least, to differentiate between 1) the drinking water and basic domestic water needs, which should be considered as a human right; 2) water for non-basic individual and collective urban purposes which represent a citizen right (water for cleaning uses, maintenance of public gardens...) and 3) water for the urban-tourist sector (hotels and residential resorts). Between the basic access to good quality drinking water, still lacking in many areas around the world, and the exclusive residential resorts with private swimming pools, gardens and jacuzzi, there is little in common, but all these type of urban uses enjoys in Spain the same maximum priority for water. This is quite unfair from the point of view of social needs and from the point of view of economic rationality, since many tourist activities receive a privileged treatment regarding water access when compared to agricultural or industrial activities, by means of their urban status.

The case of agricultural uses is even more complex. Irrigated lands include very different systems in terms of socio-economic characteristic and environmental costs and benefits. In a simplified way, in Spain there are two models of irrigated lands representing both extremes of a gradient. The first one is the traditional, familiar irrigated land, based on the sustainable use of resources, such as renewable water and soils with high natural fertility. These traditional irrigated lands have created agro-landscapes, usually along the river valleys, with outstanding landscape and biodiversity values. Moreover, these traditional irrigated lands have a rich cultural heritage accumulated along a thousand years of history. Paradoxically, these agro-landscapes, the most suitable for irrigation, are disappearing due to their transformation into urban areas.

The second case is that of intensive irrigated lands, with an almost industrial production system, belonging to big agro-business for the international market, usually located outside the river valleys in areas with no renewable water nor fertile soils, which require a high consumption of energy, non-renewable resources and chemical inputs. These two types of agricultural systems (traditional irrigated lands and intensive agro-business irrigation systems) are very different in terms of social and environmental costs and benefits, but despite of this they are treated similarly in terms of water rights in a context of scarce water resources.

Clearly, it is necessary a completely new approach to establish priorities and rights to water uses taking into account their environmental, social and economic context and independently of their generic consideration as urban, agricultural or industrial status. According to the European Declaration for a New Water Culture (Annex 2), Water uses should be prioritized according to the functions of water. Three levels of priority should be considered:

i) *Water for life*. The top priority is basic water supply for survival of people, which must be recognized as a universal human right. The maintenance of the essential environmental functions of water and aquatic ecosystems must also be guaranteed, as a basic need for a sustainable and healthy biosphere.

ii) *Water for general interest purposes*. The second level of priority applies to the need of preserving public health, social cohesion and equity. Here it is included the urban water supply for more general purposes and the maintenance of traditional sustainable irrigated systems with a high social interest.

iii) *Water for economic growth.* The water-based economic activities oriented by private interest constitute a third level of priority (being agro-business, industrial or tourist water uses). These water-based economic activities should access to water only after the previous priorities (water for life and water for general interest purposes) are met. Moreover, water for private interest must be managed under the control of public authorities and applying principles of economic rationality in order to optimize economic efficiency.

These new priority levels according to water functions are part of a new paradigm, the New Water Culture, which in Spain has been proposed in recent years as a response to the crisis of the old hydraulic policy, the emergence of new actors in the water debate and the existence of serious conflicts regarding water planning and management.

III - The need for a new water culture and the FNCA

In Spain and other countries with scarce water resources, water management has been based, especially during the last century, on a quite simplistic vision. Along century XX the Spanish hydraulic policy has focused on hydraulic infrastructures to provide water mainly for irrigation and hydropower. This old hydraulic policy based on irrigation and hydraulic infrastructures as key elements, has been re-applied during the last decades which has significantly decreased the amount and quality of water resources, has damaged the aesthetic, environmental and cultural values of landscapes linked to water, has degraded rivers, ephemeral channels and wetlands and threatens many environmental roles of water and the long-term sustainability of the water-intensive economic activities. Moreover, public hydraulic infrastructures and other decisions regarding water have frequently favored corruption and irregularities (Martinez Fernandez and Brufao Curiel, 2006).

Although reservoir based irrigation systems, at the beginning of the last century, represented an important issue for development in Spain, this is no longer the current situation. Such supply-driven water policy is increasingly at odds with the quick social and economical evolution of Spanish society, with its evident change in preferences and social values and with the increasing environmental awareness (del Moral, 1999; Martínez-Fernández and Esteve-Selma, 2000; Llamas and Pérez-Picazo, 2001; Arrojo, 2001; Arrojo, 2004; Estevan and Naredo, 2004; Ferrer *et al*., 2006). This is also the case in other countries where irrigated agriculture and hydraulic infrastructures are generating a growing conflict on a global scale regarding environmental sustainability and wildlife conservation (Bird and Wallace, 2001; Forrest, 2001; Institute for European Environmental Policy, 2000; Institute for Prospective Technological Studies, 1997; Kingsford *et al,* 1998; Lemly *et. al*., 2000, Tardieu and Préfol 2002).

The presentation in year 2000 of a big water transfer from the Ebro basin to the Mediterranean Spanish coast initiated an unprecedented scientific, technical and social debate in Spain around water, characterized by serious social conflicts, large demonstrations of several hundred thousand people in the streets against the Ebro water transfer and big dams, a hard political discussion and especially by the sudden emergence of new actors in the water debate. These new actors were people affected by hydraulic projects (big dams and large water transfers), citizen movements

and green groups and also a considerable part of the academic community. All these new actors demanded more public participation in the taking decision process and a greater consideration to the environmental, social and cultural issues of water and aquatic ecosystems.

In 1998 it was created the Iberian Foundation for a New Water Culture (FNCA), which joined Spanish and Portuguese scientists and water experts coming from very different disciplines, from engineers and ecologists to jurists and economists. The FNCA played a very important role providing fruitful links between the scientific and academic side and the social and citizen movements side (see Annex I). The rejection in 2004 of the Ebro water transfer meant the recognition that water was a top issue in the political and social debate and that in Spain the old hydraulic policy was no longer feasible.

The European Union has adopted an innovative approach for the sustainable use of water resources and the protection of the ecological status of all water bodies. The European Water Framework Directive (WFD), which passed in 2000, is pushing a drastic change of the Spanish water management, since it requires a completely new paradigm which agrees with the main demands of the New Water Culture. The main goal of the WFD is the achievement of a good ecological status for all water bodies and the sustainable use of water resources. The WFD means a very innovative approach to water management, based, among other principles, on the good ecological status of water and aquatic ecosystems, the integrated management of all surface, groundwater, transition and coastal waters, the recognition of the watershed as the basic management unit, the public participation of citizens and all stakeholders in the processes of water planning and the full cost recovery of services providing water resources. The effective implementation of these principles, also demanded and supported by the new water culture, will require a strong and continued effort of all agents, since new water institutions or a profound transformation of existing ones are required.

IV - The European declaration for a new water culture

The FNCA has been very active in promoting a new water culture also in other areas, especially in Europe, with the European Declaration for a New Water Culture, and in South America, where in December 2005 promoted the celebration of the South American Meeting for a New Water Culture.

The FNCA initiated a debate in the European academic world to elaborate the European Declaration for a New Water Culture, a process involving one hundred European water experts from all disciplines, a Scientific Committee of twenty university professors chairing the debates, a series of meetings in different European countries and national and international bodies and organizations with the role of observers of the process. The European Declaration for a New Water Culture was finally signed in February 2005 in Madrid, by 74 water experts coming from 21 European countries, hosted by the Ministry of Environment and with the support of rectors of Universities, representatives of water authorities, NGOs, green groups and citizen movements.

The European Declaration for a New Water Culture (see Annex 2 for a synthesis), now signed by almost two hundred European water experts, supports a shift from the supply approach to the demand management approach, the implementation of the European Water Framework Directive, the ecological conservation of rivers, wetlands and other aquatic ecosystems, an effective public participation, the full cost recovery and a shift from the traditional categories according to urban, agricultural or industrial water use to a new prioritization according to water functions, distinguishing among water for life, water for general interest and water for economic growth.

The Mediterranean countries share many of the water problems and issues present in Spain. Current and future challenges will arise from decreasing water resources due to the climate change, increasing water demands and uses and also from the evolution of society and the likely

emergence of new actors and social preferences. A new perspective and new water culture, based on the sustainability paradigm, the public participation and the conservation of the environmental and cultural heritage linked to water, will also be required to face these new challenges.

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ANNEX 1. STATEMENT OF THE NEW WATER CULTURE FOUNDATION

New Water Culture Foundation (http://www.fnca.eu)

We are living in shifting times, times when our prevailing model for development is being questioned. The idea of science and technology acting as tools for "dominating" nature and for feeding a development based on limitless growth in a limited world is coming to be seen as outdated. It is giving way to a more mature outlook. An outlook which studies the complexity of nature so as to work out a sustainable approach for our development.

The present model of development and political policies have led to a frenetic destruction of the reference points of our collective identity and a cultural devastation. This situation demands that we study the concept of sustainability and incorporate social and cultural values and heritage into this, forming an eco-social sustainability. We need to promote a new model of development based on inter-generational ethical values. The social, cultural and natural heritage of people should be considered a loan for the coming generations rather than an inheritance from the past.

In this context even the governments own documents, such as the White Paper on Water in Spain, recognizes that the traditional model of water management inherited from 19th century ideas is in crisis. However, supply strategies based on huge subsidized public works, justified in the name of "the common good", still dominate the policies of the Spanish and Portuguese governments. They are also present to a certain extent in policies of the main opposition parties, although they are gradually changing. The key to this situation lies in the cultural and social inertia of our society, encouraged in the media by the lobby groups which have traditionally benefited from these kinds of policies.

The present socio-economic situation in Spain and Portugal is, fortunately, not that of the beginning of the 20th century. The challenges facing society then were based on overcoming the underdevelopment and illiteracy of the mainly rural societies which were chiefly dependent on the primary sector. However, nowadays in the European Union, the most immediate challenges are those of designing and developing new approaches towards sustainable development.

1. Outlines of the present situation

The water policy and building of large hydraulic works were essential for industrial, agricultural and urban development for a large part of the 20th century. These unquestionable achievements have led to a certain myth making about this productionist focus on water policy. This productionist myth, based on a massive state subsidy for the management of surface waters, has generated unsustainable spirals of demand. It has also led to unacceptable levels of economic inefficiency and irrationality.

In contrast, the management of ground waters has traditionally been developed using private rights of ownership and use. As the water users accept that they have to pay the necessary infrastructure and operating costs in this case, with very few subsidies, this has led to a more efficient and competitive management model. However, the individualistic nature of this model and a lack of responsibility shown by the Authorities has given way to serious situations of pollution, salinisation, and overdrawing of aquifers. The lack of official control in areas such as the Segura river basin, Castellón, Almería, Jaén or La Mancha has allowed flagrant illegality, insolidarity and led to a complete absence of organization of collective intelligence. These situations are calling out for a deep social-cultural change which is unlikely to come about if the Authorities do not take on the responsibilities they are obliged to by law.

The absence of criteria for urban and regional planning in coherence with sustainable development in large urban areas, and especially in the main tourist areas on the Mediterranean coastline, the Balearic Isles, and the Canary Islands, completes the panorama of what in Spain are habitually considered "water deficient areas". Offering grand inter-basin water transfers as a "solution" to

this situation is an example of irresponsible dead-end politics which will inevitably encourage the spiral of unsustainability and bring about enormous economic, social and environmental costs.

The lack of territorial arguments to justify the need for inter-basin transfers as a part of hydrological planning has been denounced time and time again. The interplay between hydrological planning and territorial development cannot be resolved with imprecise and ambiguous terms like "hydrological imbalances", or speaking about basins as either having a deficit or a surplus of water resources. From a territorial point of view, any public interventions regarding water, especially the idea of redistributing it geographically, require explicit references to the wider strategies for development. This is the minimum requirement for social debate and agreement. This should be essential in a state currently immersed in a process of transformation of its territorial political structure. The absence of such reference points and social agreements is one of the key factors for the institutional framework in which inter-regional water conflicts flourish.

Furthermore, the systematic contempt towards the values, functions and environmental services offered by river ecosystems has led to an unprecedented process of degradation of our rivers, and their accompanying riversides and wetlands, with huge direct and indirect costs. What we have now learnt about these complex ecosystems allows us to better appreciate the value of a river and its riverside vegetation, deltas, estuaries and littoral platforms. Amongst other functions, they provide a natural treatment of waters, the calming of river floods, conservation of bio-diversity, and balanced transport and distribution of sediments along the river bed, deltas, and beaches.

The deep relationship between rivers and our lands and society has been forgotten or ignored over and over again. The pre-eminence of the productive uses of water has led us to destroy extremely valuable natural heritage and ignore the rights of the peoples who have lived in the river valleys for hundreds or even thousands of years forming a significant relationship with the rivers. The right of these people and communities to live where they have laid down the roots of their very existence deserves a place in the list of human rights as it should be valued and respected. This runs deeper than the simple win-lose game of "majorities" and "minorities", so often mentioned to cover for, in the name of the "common good", the business interests of lobby groups.

There has been a huge sacrifice of social and natural heritage in Spain, especially in high lands, thanks to the building of over 1,200 large dams, together with the continuous destruction of riverside vegetation, the drying up of wetlands and a generalized pollution of continental waters. This should set an extremely high value on the rivers, wetlands and other water bodies which are still well preserved. It should also mean that the people whose lands and households are threatened by the building of reservoirs have a certain moral authority in their fight against the construction of these large dams which are putting their very survival at risk.

2. The outlines of the change towards a New Water Culture

Within the context of this crisis, the urge to work towards a new sustainable model of development has given birth to a wide social movement in favor of what is coming to be known as the New Water Culture. The emphasis on the word Culture is neither coincidence nor a merely semantic use, rather it reflects the need to set up an open and wide framework which goes further than purely technical or political thinking. We must accept a radical change in our way of thinking, moving on from the present understanding of water as just a productive utility. It should be seen as an eco-social question, where the word "eco" recovers its full Aristotlean meaning of "oikonomia" - the art of a correct administration of the house - with its combination of economy and ecology.

Understanding rivers as complex and dynamic living bodies, and not as mere collectors of water. Accepting that quantity and quality are two sides of the same coin. Seeing that having waters of good quality means respecting and preserving the functionality and life of the ecosystems which make up the natural cycle of water. Recovering the traditional leisure values of water, the aesthetics and symbolism of these landscapes, so characteristic of the Mediterranean, both

formed and influenced by water. All this requires a cultural change, not only in the Administrations, but also in society as a whole.

The concept of landscape, as seen in the recently implemented European Landscape Convention ("an essential component of people's surroundings, an expression of the diversity of their shared cultural, natural, economic and social heritage, and a foundation of their identity), constitutes a new institutional support for the panorama of a New Water Culture. The idea that landscape represents an essential element of individual and social well-being. The reference to the historical and natural fortuitousness of landscape, overcoming simplistic or superficial treatments, acknowledging the factors that have made possible a certain kind of territory. The application of the precautions laid down in the Convention to protect, plan and manage water landscapes, some of the most vulnerable and threatened sectors. All this together with the aspirations of the peoples concerned lays out the road to the New Water Culture.

One of the keys of the New Water Culture is the concept of conservation. Not just conservation of the physical and chemical quality of the waters, but quality as seen from an ecosystem perspective. Maintaining the functions of wetlands, rivers, and their riverbanks means that they, in turn, will offer sustainable environmental services and values, starting with that of a renewed availability of high quality water resources.

Another key factor is undoubtedly that of efficiency. Moving on from the traditional supply strategies to a new outlook based on demand management. This involves serious rethinking on basic concepts of the present model such as that of demand. Demand has usually been explained as an independent variable which the supplier must simply satisfy but not question. Redefining this concept, based on Economics Science, as a variable dependent on many institutional factors, especially that of price, would open up a radically different vision which would allow for a large range of management options.

The third factor is in organizing society's collective intelligence so as to design a sustainable regional planning. This involves integrating water management into regional development based on sustainable coherence as the new backbone of a renewed idea of the common good.

To progress along this route of finding new solutions based on this new outlook demands a significant renewal of water management institutions. The clear engineering bias in these institutions is a simple consequence of the road they have followed since their origins. Their policies have always concentrated on activities "promoting" large public construction works. The opacity of this management, in turn carefully controlled by the grand construction, electricity, and irrigation lobbies, together with a suffocating bureaucratization in place, is currently threatening the prestige of the Hydrographic Confederations in Spain and the Portuguese Water Institute.

Notwithstanding this, the movement towards a New Water Culture, of which this Foundation forms a part, does not pretend to reject the historical contributions or inheritance of the structuralist model. Nor does it pretend to devalue or ignore the valuable contributions of developed technology that civil engineering can and must keep making in the field of water management. It does not want to question the importance of public institutions in this matter. On the contrary, we see that the Administration has an important role to play in organizing this collective intelligence demanded by the sustainable development panorama. However, we also believe that a deep renewal of the Administration is urgent and indispensable, as originally proposed by Joaquin Costa. This New Water Culture, a free flow of information and ideas between different areas of study, and the citizens' participation in decision-making are the keys for this change.

One of the most pressing questions to deal with is, without doubt, the management of river basins. The European Paper on Water and the Water Framework Directive of the EU demand that Spain and Portugal refocus their water management within the natural framework of their corresponding basins. Although this principle has traditionally been accepted by Spanish administration, it

has only been considered in the framework of national borders. To organize the planning and management of waters beyond these simplistic frontiers, integrating social, environmental and economic realities of the territories which form part of each hydrographical basin, on either side of the political frontier, requires a deep change in the way of thinking of both countries. The participation and direct dialogue between the peoples and institutions of both countries within each basin, without lessening the importance of their respective national sovereignties, is a challenge we must take up and a task to be carried out urgently.

On the other hand, it is not just a question of overcoming these frontiers but also of integrating important factors into the management of each basin, such as delta and estuary ecosystems, and littoral platforms with the decisive influence they receive from rivers and their enormous social, economic and ecological importance. The usual avoidance of dealing with these ecosystems of utmost important bio-diversity, together with the challenge of trans-frontier integration and the objective of recovering the good ecological state of our rivers, demanded in the new Framework Directive, poses the need for a deep rethinking of the present notion of "basin management".

3. Times of crisis, times of opportunism

Times of crisis are times of confusion, and confusion feeds opportunism. Recently, the relaxing of regulations regarding water rights and the creation of a market of these rights has created expectations of renewal and incentives for efficiency. The entrance of privatization processes in the services of water distribution and urban management promoted by new and powerful multinational business sectors is modifying the traditional framework of interests and its respective power game. All these new elements call for reflection and evaluation.

The role of a market clearly allows for incentives of efficiency which could promote useful improvement processes in the distribution and productive use of waters in the agricultural, industrial, and urban sectors. However, it is also true that market dynamics completely ignore questions relating to the management of social, environmental, ethical and regional equality values. Hence, to consider the marketplace as the "magic wand" which will guarantee a New Water Culture is a serious mistake.

The Reform of the Water Law in 1999 in Spain has led to the prevalence of market options in a confusing sea of water concessional rights, and all this within a context of generalized misgovernance of water uses. These confusing market options together with the expectations of large water transfers, encouraged by the present National Hydrological Plan, are opening the gates for huge processes of speculation. Thanks to the incentives offered by the unsustainable dynamics of the urban-tourism development of the Western Mediterranean, these processes threaten not only the hydrological reality of the Ebro, but that of the majority of the Atlantic river basins shared with Portugal.

Therefore, while it is necessary to consider how to make the most of the potentials of the marketplace, it is also necessary to remember its limitations and falsehoods.

4. The Foundation for a New Water Culture

Herein we have laid down the context and the challenges we face. Two Iberian Congresses for the Planning and Management of Waters (Zaragoza, 1998, and Oporto, 2000) have opened a breach in these moments of crisis and transition, projecting light, illusion and endeavor in favor of the New Water Culture. Taking this baton, of compromise and expectations, the Foundation accepts the challenge of developing the New Water Culture in a setting of sustainable development.

The tasks we will carry out are those which first laid the seed for the Iberian Congress:

1. Develop projects of interdisciplinary research to analyze the most important water management problems in the Iberian Peninsula and other territories of Spain and Portugal.
2. Develop interdisciplinary networks, means of communication, and technical-scientific debate in relation to water management, paying special attention to the relationship between universities, business, and the Administration.
3. Promote the bringing together of the citizens belonging to the social collectives and institutions of Spain and Portugal and their mutual knowledge with a view to favoring the integrated and combined management within each shared hydrographical basin.
4. Encourage and promote the relationship between scientific-technical fields and the social movements with an interest in this matter, fostering information, training and social debate.
5. Promote the development and application of this New Water Culture in the European Union with a special focus on the realities of the Mediterranean environment and also those of Latin America, closely linked to Iberian countries by culture and history.

ANNEX 2. Summary of the European declaration for a new water culture

http://www.unizar.es/fnca/euwater

The fact that over 1.1 billion people do not have guaranteed access to drinking water and over 2.4 billion do not have safe sanitation, whilst the health of the planet's aquatic ecosystems is breaking down, has prompted the emergence of growing social and political conflicts worldwide. Achieving sustainability, equity and democratic governance in water management is one of the main challenges for the international community in the 21st century, and we believe that the scientific community must become involved in this debate through an inter-disciplinary effort.

Taking on this challenge requires far-reaching changes in our scales of values, our conception of nature, our ethical principles, and in our lifestyles; in short, there is a need for a cultural change that we have termed the birth of a New Water Culture. A New Culture that must assume a holistic approach and recognize the multiple dimensions of ethical, environmental, social, economic, political, and emotional values embodied in aquatic ecosystems. On the basis of the *universal principle of respect for life*, rivers, lakes, springs, wetlands and aquifers must be considered as the *Heritage of the Biosphere* and must be governed by communities and public institutions in order to guarantee their *democratic and sustainable management*.

During the 20th century, the principle of the domination of nature led to *productivist* water management approaches. The predominant *supply-side* strategies, based on large hydraulic works paid for by public subsidies, have induced careless resource utilization, while the individualistic approach in groundwater management has induced a lack of collective rationality. These productivist approaches are in a deep crisis due to:

1. The breakdown of the water cycle and the degradation of aquatic ecosystems resulting from the impacts of large hydraulic infrastructures, depletion and pollution of water bodies, and wetland desiccation;
2. The excessive exploitation and degradation of underground aquifers;
3. Worsening water quality (especially by diffuse pollution) with dramatic public health impacts, particularly in developing countries and poor communities worldwide;
4. Social conflicts originating in the lack of respect for the human right to essential water services or in the displacement of huge populations from their land by large-scale hydraulic schemes, among other issues;
5. Problems of inefficiency and economic irrationality derived from supply side strategies;
6. A crisis of governance due to the lack of consensus about the principles and ethical values that should provide the basis for the design and implementation of water policies
7. Citizen defenselessness owing to the weakness of democratic systems in promoting social participation in the design, implementation and monitoring of these policies.

Moreover, climate change is likely to increase water-related hazards and threats and must be confronted through a serious application of the Precautionary Principle. In particular, there is a need to prioritize alternative strategies to the traditional large-scale engineering solutions, and recover the good ecological state of aquatic ecosystems.

1. The Water Framework Directive and the New Water Culture

The European Water Framework Directive (WFD), one of the most advanced examples of environmental legislation in the world, aims to tackle this crisis, and many of its objectives and propositions are compatible with our proposal for a New Water Culture:

i) Adopting an ecosystemic approach with the central objectives of recovering the *good ecological state* of rivers, lakes, lagoons and wetlands, as well as the *good quantitative and qualitative state* of aquifers. Furthermore, the WFD redefines the concept of basin which now also includes deltas, estuaries, and coastal ecosystems;

ii) Introducing new criteria for economic rationality in water management governed by the *cost recovery* principle, including *environmental costs* and *scarcity value*;

iii) Opening water management activities to *proactive* citizen *participation* and *monitoring*;

iv) Promoting the sustainable and equitable management of transboundary river basins.

These criteria and objectives represent a shift from traditional *supply-side strategies* to *demand-side* and *conservation strategies*, prioritizing water saving, efficiency improvements, and the introduction of new technologies, as well as groundwater conservation strategies under integrative and sustainable approaches. Under the same logic, the WFD induces new approaches for the management of flood and drought risks.

Being coherent with the principles of the New Water Culture will require moving even further in order to assume a holistic approach to water management. Undoubtedly, the restoration of rivers, lakes, springs, wetlands and aquifers as a heritage of the biosphere, including its values of collective identity, aesthetic beauty, and quality of life, will pose a significant challenge. In this context, we believe that the highest priority is to adopt a new ethical approach based on the recognition of the different functions and values of water in order to prioritize the rights involved:

i) *Water for life.* The basic function of water of providing survival for humans must be recognized as a top priority, a universal, *human right*. The sustainability of the biosphere and the exercise of human rights must be guaranteed on the basis of the principle of efficacy.

ii) *Water for general interest purposes*. This concerns the functions of water in preserving public health, social cohesion, and equity, which must follow in the ranking of priorities. This function is connected with the social rights of citizens and with society's general interest, and must be governed by the principle of social efficiency.

iii) *Water for economic growth*. This refers to the function of legitimate water-based economic activities oriented by private interest, which must be recognized as being a third level of priority. This function is connected with the individual right to improve living standards, and water for this function must be managed under principles of economic rationality in order to optimize economic efficiency.

2. Challenges and proposals

Within the EU the challenge of ensuring a correct implementation of the WFD requires:

i) The defense of the *Principle of no deterioration* of aquatic ecosystems when faced with practices of *fait accompli* in national water policies;

ii) Preventing abusive practices in the characterization of "heavily modified water bodies" by national governments;

iii) Adopting rigorous criteria for defining and measuring the *good ecological state* of water bodies across Europe;

iv) Ensuring a serious and progressive implementation of the *cost recovery principle*;

v) Guaranteeing that institutional reforms in the water sector promote substantive citizen participation in the decision making and monitoring processes.

On a wider international basis the EU must accept responsibility in making a substantial contribution towards developing the principles of sustainability and democratic, participatory governance of water worldwide. This should be part of a wider effort towards achieving a multi-lateral and democratic world order, and will require the adoption of a serious commitment in the fight against poverty and inequity, which must be done by:

i) Adapting actions to the realities of each location, fostering the capacity building of local and regional levels of government with active citizen participation;

ii) Conditioning any financial support for major dam projects to the strict fulfillment of the recommendations of the *World Commission on Dams*;

iii) Promoting an international *Public Services Code* that will guarantee that the standards of citizens' rights in relation to water are analogous to those we defend in Europe;

iv) Making effective efforts to enhance education about water, as the key driver to promote the much sought cultural change towards a New Water Culture.

Finally, we recognize that there exist wide-ranging positions held by the scientific and technical community, and by the European society at large, regarding the debate on the liberalization of water services. We believe that, regardless of the water management model adopted:

i) Essential water services must be granted the status of *general public interest* to guarantee the priority of human and social citizenship rights over market interests;

ii) Current debates on the liberalization of water services must be subject to broad-based public debate, with substantive participation of citizens, NGOs, workers' unions, user organizations, and other relevant actors in the decision making and monitoring process;

iii) The achievement of the Millennium Development Goals (MDGs) will require that governments and international institutions take urgent decisive action to meet the financial cost involved, as a matter of public duty;

iv) Public and private operators alike must be subject to strict regulation by representative public bodies to ensure transparency and citizen participation;

v) International financial institutions and the development agencies of the OECD countries should no longer condition the financing of investments by liberalization and privatization. Their efforts should be centered on supporting the public sector to achieve the MDGs, demanding democratization, respect for human rights, transparency, and fighting corruption.