



**Environment at the crossroads.
Aiming for a sustainable future.**
Gulbenkian Conference 2009
27 and 28 October

The ethical challenge of sustainability in water management

Pedro Arrojo Agudo

The fact that 1200 million people cannot take for granted the access to potable water underlines the problem of scarce resources as regards the population growth and all kinds of demands. However, these problems only represent the human face of the crisis of unsustainability that we have caused on the continental aquatic ecosystems. In the places where once they could drink, today the most vulnerable communities get sick and poisoned, which happens mostly to underprivileged populations and, particularly, children.

The second front of this crisis of unsustainability of aquatic ecosystems has its origins in the destruction and degradation of fishery resources, which are an expression of the crisis of biodiversity in the continental water area. This seriously worsens the problems related to hunger since fish is considered the “protein of the poor”. The loss of health in rivers, lakes, wetlands and marshes affects not only fisheries in freshwater or transitional waters, but also those carried out in coastal marine areas, which are mainly fertilised by the massive amounts of continental nutrients carried down by rivers.

Apart from the severe social impact they have caused on displaced populations (around 80 million people), big dams have degraded the good health of river habitats causing the extinction of numerous fish and mollusc species. On the other hand, the drastic alteration of flood and inundation cycles caused a serious impact on the traditional forms of farming and cattle-raising production, in the alluvial plains of many rivers, that are related to those cycles and on which depends the subsistence nourishment of millions of people.

Finally, the crisis of unsustainability of aquatic ecosystems and aquifers is seriously reducing the continental *water cycle resilience*, causing the severe increase of the impact of the current climate change. Impact that is related to increasing risks (due to the intensity and frequency) of droughts, storms and other extreme climatic events, as well as to the degradation of deltas (subsidence) and coastal ecosystems (caused by the destruction of marshes, collapse of solid flows, sand in large dams, etc.) in synergic convergence with sea level rises due to global warming.



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Born in Madrid in 1951, Pedro Arrojo Agudo is a PhD in Physical Sciences from the University of Zaragoza and, currently, he is a Full Tenured Professor in the university's Economic Analysis Department. Over the past 20 years, his research has focused on "Economics of Water", and his most relevant work has been published in the following books: *La gestión del agua en España y California* (Bakeaz-Bilbao, 1997), *Biscarrués-Mallos de Riglos: inundación o modernización* (Egido Edit), *Valoración de las aguas subterráneas en el marco económico general de la gestión de aguas en España* (Fund. Marcelino Botín), *El Plan Hidrológico Nacional: una cita frustrada con la historia* (Editorial RBA, 2003), *El Reto Ético de la Nueva Cultura del Agua* (Edt. Paidós, 2005), "Water Planning in Spain", Llamas y Garrido (Edt) in *Water Policy in Spain*, "Estrategias de Sequía en perspectivas de cambio climático" in *El Cambio Climático en España y sus consecuencias en el sector del agua* (Criado, Hernández, Arrojo y Ramos, Universidad Rey Juan Carlos & Aqualia, 2008), "La Nueva Cultura del Agua: el debate sobre los trasvases del Ebro" in *El Libro del Agua* (Ed. Debate, 2008), *La Nueva Cultura del Agua del Siglo XXI* (Icaria-Tribuna del Agua-Expo-2008).

Pedro Arrojo Agudo was Chairman of the first two Iberian Congresses on Water Planning and Management (Zaragoza 1998 and Porto 2000) and Chairman of the First Latin-American Meeting for a New Water Culture (Fortaleza-Brazil). Between 2001 and 2003, he led the interdisciplinary team of the *Fundación Nueva Cultura del Agua*, which was responsible for assisting the European Commission during the debate on the Spanish National Water Plan. In 2005, he chaired the Scientific Committee that drew up the European Declaration for a New Water Culture and published "Sustainability, Equity and Economic Viability in Water Management" in *The European Files*. In 2006, he took part in the "Expert Committee on Drought Management" of the Spanish Ministry of Environment and, in 2007, he chaired the "Expert Committee on Water Markets" of the aforementioned Ministry. In 2007-2008, he chaired the Expert Panel of the Ministry of Environment on "*Figuras de transferencia de derechos de agua: Centros de Intercambio y Contratos de Cesión*".



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Pedro Arrojo is a member of the Water Council of the Ebro Basin, member of the UNESCO MAB Committee (*Man and Biosphere*), member of the Scientific Committee of the World Congress of IWRA – *International Water Resources Association* (Madrid-2003) and has chaired until the current year the *Fundación Nueva Cultura del Agua*, which organised the Iberian Congresses on Water Planning and Management with the support of 70 universities from Spain and Portugal. In 2003, he was awarded in San Francisco the Goldman Environmental Prize for Europe.