



PRESENTATION

We live in times of crisis in which the international community must pause to reflect and decide which model of global governance we must take on board for the 21st century. We must face up to the ever worsening crisis of social and environmental unsustainability in the world.

With reference to water resources, the systematic destruction and degradation of water ecosystems and aquifers has already led to dramatic social repercussions. 1,100 million people with no guaranteed access to drinking water, and the breakdown of the hydraulic cycle and health of rivers, lakes and wetlands are two consequences of this crisis.

From our position in the old Europe, the positive ongoing experience of overcoming frontiers and the significant power and influence of the European Union on the international stage must encourage us to take on serious commitments so as to overcome this crisis. The citizens' movement for a New Water Culture in the EU over recent years represents a promising move in this direction.

In this context, we, the scientific community, have a moral obligation to contribute to the development of this New Culture with our knowledge and commitment. This present Declaration represents a contribution in this sense from a large and prestigious sector of the European scientific community, open for subsequent discussion in both Europe and the rest of the world.



DESCRIPTION OF THE PROCESS

The debate regarding the management and planning of water resources is currently one of the greatest challenges for the scientific community, governments and society in general. Hence, it should come as no surprise that more and more meetings, debates and studies are being devoted to this question.

The Water Framework Directive opens up new horizons and perspectives, within the sphere of the European Union, which must be defined and analysed.

At the same time, many conflicts related to water policy have arisen within the European Union, each with distinct features. A better awareness of these conflicts and the way they have been dealt with could be of great help in current and future debates.

With this project, the Foundation for a New Water Culture proposed to initiate a process of discussion, in the academic world, which would lead to the signature of the “European Declaration for a New Water Culture” by one hundred experts from all the disciplines related to water management models.

This initiative has involved a Scientific Committee consisting of twenty university professors whose mission has been to chair debates and present proposals of the document to be discussed by other members of the Group of Experts, after including contributions by members of this group.

National and international bodies and organisations have performed the role of observers of this process, having both a presence and a say in the aforementioned discussions and debates.

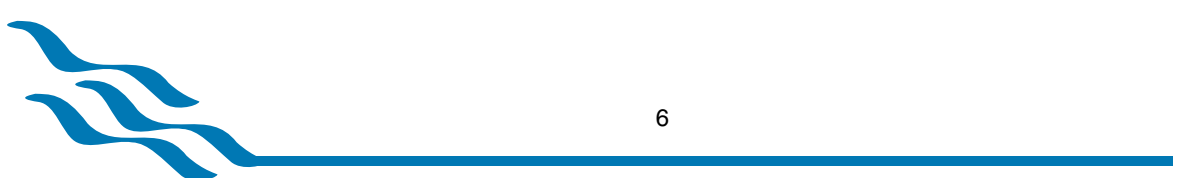
The process of actually drawing up the declaration has been based on physical meetings, emails and a forum on the project’s webpage <http://euwater.unizar.es>, with restricted access.

The diverse reality of the problems associated with water management in Europe has led to the organisation of regional meetings so as to incorporate the specific needs and problems of each area. The calendar of meetings has been as listed below:

- 24 and 25 January 2004, Zaragoza, Spain. Constitution of the Scientific Committee.
- 7 and 8 May 2004, Val de Marne, France. First regional meeting: Central Europe.

- 15 and 16 October 2004, Malaga, Spain. Second regional meeting: Mediterranean Europe and Portugal.
- 17 and 18 December 2004, Bucharest, Rumania. Third regional meeting: Eastern Europe.
- 14 and 15 January 2005, Rome, Italy. Final meeting of the Scientific Committee. The definitive text of the Declaration is passed after acceptance of contributions from the various meetings and web page forum.

The Declaration for a New Water Culture will be officially signed on 18 February 2005 in Madrid in the presence of the observing bodies and other organisations which have supported or collaborated in this project along with other prominent international personalities related to the world of water management, in an act hosted by the Spanish Government's Environment Ministry.





SUMMARY

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 a careless resource utilisation, while the individualistic approach in groundwater management has induced a lack of collective rationality. These productivist approaches are in a deep crisis due to:

- The break down 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;
- The excessive exploitation and degradation of underground aquifers;
- Worsening water quality (specially by diffuse pollution) with dramatic public health impacts, particularly in developing countries and poor communities worldwide;

- 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;
- Problems of inefficiency and economic irrationality derived from supply side strategies;
- 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
 - citizen defencelessness 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 prioritise alternative strategies to the traditional large-scale engineering solutions, and recover the good ecological state of aquatic ecosystems.

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:

- 1- Adopting an ecosystemic approach with the central objectives of recovering the *good ecological status* of rivers, lakes, estuaries, coastal waters and protection of wetlands, as well as the *good quantitative and qualitative status* of aquifers. Furthermore, the WFD redefines the concept of river basin which now also includes deltas, estuaries, and coastal ecosystems;
- 2- Introducing new criteria for economic rationality in water management governed by the *cost recovery* principle, including *environmental costs* and *scarcity value*;
- 3- Opening water management activities to *proactive citizen participation* and *monitoring*;
- 4- 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*, prioritising 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, springs, lakes, estuaries, coastal waters and





protection of 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 prioritise the rights involved:

- *Water for life*. The basic function of water of providing survival for humans must be recognised 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.
- *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.
- *Water for economic growth*. This refers to the function of legitimate water-based economic activities oriented by private interest, which must be recognised 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 optimise economic efficiency.

Challenges and proposals

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

- a) The defence of the *Principle of no deterioration* of aquatic ecosystems when faced with practices of *fait accompli* in national water policies;
- b) Preventing abusive practices in the characterisation of "heavily modified water bodies" by national governments;
- c) Adopting rigorous criteria for defining and measuring the *good ecological status* of water bodies across Europe;
- d) Ensuring a serious and progressive implementation of the *cost recovery principle*;
- e) 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:

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

- Conditioning any financial support for major dam projects to the strict fulfilment of the recommendations of the *World Commission on Dams*;
- 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;
- 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 recognise 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 liberalisation of water services. We believe that, regardless of the water management model adopted:

- 1- 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;
- 2- Current debates on the liberalisation 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;
- 3- 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;
- 4- Public and private operators alike must be subject to strict regulation by representative public bodies to ensure transparency and citizen participation;
- 5- International financial institutions and the development agencies of the Organization for Economic Co-operation and Development countries should no longer condition the financing of investments by liberalization and privatization. Their efforts should be centred on supporting the public sector to achieve the MDGs, demanding democratization, respect for human rights, transparency, and fighting corruption.





EUROPEAN DECLARATION FOR A NEW WATER CULTURE

1. A commitment from the scientific community

Over 1.1 billion people do not have guaranteed access to drinking water and over 2.4 billion do not enjoy the benefits of safe sanitation. At the same time, the health of the planet's aquatic ecosystems is breaking down, in some cases irreversibly. This situation has prompted the emergence of an increasing number of social and political conflicts worldwide.

The international community has responded with a number of proposals, the most relevant of which are, firstly, the UN *Millennium Development Goals* (MDGs), aimed at halving the proportion of the world's population that have no sustainable access to safe drinking water and sanitation by 2015 and, secondly, the EU's *Water for Life* initiative, to support the MDGs.

As regards the ecological crisis, the EU *Water Framework Directive* (WFD) is an attempt to introduce an integrated approach to water management that could lead to the recovery of aquatic ecosystems and provide instruments for a more rational management of water. Nevertheless, despite these significant initiatives there are evermore worrying signs that these goals may not be reached and that the situation is already worsening in many countries. It is increasingly recognised that it will not be possible to achieve *sustainable and equitable systems for the management of water* in the absence of "good governance". This requires the concerted action of all key players, in particular local authorities, the private sector, trade unions, civil society organisations, and private citizens.

We believe that there is an urgent need for more committed involvement on the part of the scientific community to search for solutions to the challenges posed by this global state of affairs. However, the nature of the problem exceeds the tech-scientific dimension and demands the adoption of inter- and cross-disciplinary approaches. Moreover, the involvement of the scientific community often reflects internal divisions existing in society at large, as regards crucial issues such as the model of economic development to be followed; the values and principles that should prevail in the social and political system; or the institutional arrangements that are needed to attain prosperity and wellbeing. Traces of this lack of consensus are also present in this declara-

tion, which is the product of an ongoing debate amongst European scientists who are concerned with water from different theoretical and methodological perspectives and who have different positions in the field of social and political values and principles. We believe that this can be regarded as a strength and not a weakness as, by its very nature, science proceeds through rational debate and open confrontation of ideas in the search for objective, empirically-based evidence, which allows theory and knowledge to evolve continuously.

Leaving aside for a moment the uses of water for agriculture, hydropower or industry, aquatic ecosystems perform key functions for life in the biosphere, as well as ensuring the organisation and social cohesion of communities. At the same time, water represents our natural heritage, which is the hallmark of identity of lands and peoples. Taking on the challenge of *sustainability* requires far-reaching changes in our scale of values, our conception of nature, our ethical principles, and our lifestyles. In short, it implies a cultural change which we have identified as a *New Water Culture* in relation to water issues: a *New Culture* which, on the basis of cultural diversity, must recover the patrimony of memory and the rich symbolism that water has had for human beings from time immemorial, and integrate the new values and perspectives that the sustainability paradigm introduces. This is a *New Culture* that must adopt a holistic approach and recognise this multiple dimension of ethical, environmental, social, economic, and emotional values embodied within aquatic ecosystems, in order to build a new collective intelligence and respond to the challenges of the 21st century.

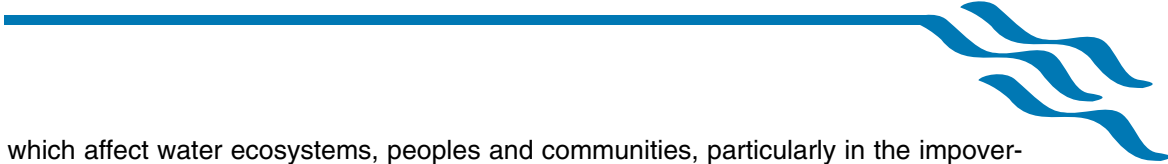
On the basis of the *universal principle of respect for life*, our rivers, lakes, wetlands and aquifers must be considered as the *Heritage of the Biosphere*, and must be governed by communities and public institutions, in order to guarantee *fair and sustainable management*.

In the EU, this has led us to question the traditional practices of *hydraulic* management, in which water is considered as simply a *production resource* and, instead, to adopt new *ecosystem-based* approaches which establish *sustainability* as the priority. This is the consistent philosophy and spirit of both the new *Water Framework Directive* and other environmental directives. However, to achieve sustainable management of water ecosystems it will be necessary to enforce these laws consistently, as well as to effectively integrate within them sector-level policies as strategies for sustainable communities and regional planning policy. Water and land are two sides of the same coin.

Beyond the scope of the EU countries, our historical responsibilities and our position in the current world order must lead us to take on these serious commitments, in order to solve the current problems of unsustainability and inequity regarding water.

Scientists and water management experts, signatories of this Declaration, aim to support the consequent implementation of the WFD in our respective states, since we consider that it will promote sustainable management approaches which are in harmony with the *New Water Culture* required by the challenges of the 21st century. We wish to contribute to clarifying and specifying the commitments we must take on at EU level, in order to play a responsible role in solving the problems of unsustainability





which affect water ecosystems, peoples and communities, particularly in the impoverished and developing countries.

This Declaration seeks to promote active discussion within the European scientific community, NGOs and international institutions involved in drafting this document as observers, and appeals for the attention and commitment of the international scientific community.

We address this document mainly to the *European Commission*, the *European Parliament* and all *EU governments*. We also appeal to the main *international institutions* and *governments* of the entire world to accept their responsibilities for this *New Water Culture* and the changes that will enable mankind to achieve equitable and sustainable management of the planet's aquatic ecosystems.

2. Productivism under the principle of the “Domination of Nature”

Water is the *soul of the Blue Planet*. It is the key element that makes life on Earth possible. It acts as the substrate of continental marine habitats and water ecosystems, and as provider of food for all living beings.

The role that water and aquatic ecosystems have played for various civilisations throughout History has been closely dependent upon the way nature was understood. The vision of nature as the basis of life gave birth to the principle of *Nature as Mother* in the most ancestral cultures. However, that symbolic myth was mixed with a rather threatening view of nature, which motivated the need to control it. Through the pre-eminence of *scientific knowledge*, established by the *Renaissance* and later confirmed by the *Enlightenment*, the principle of the *Domination of Nature* strengthened its hold as the basis of modern thinking. The conception of scientific expertise as a tool to set nature *at the service of man* thus became the basis of the overriding concept and model of economic development throughout the 20th century.

Today, to the extent that this model has entered a crisis, the principle of the *domination of nature* has done likewise. The challenge for science is no longer so much “*domination*” as it is better *knowledge* of the environment, in order to achieve harmonious integration for our socio-economic development within this natural order. Thus, the challenge of the 21st century is to develop the principle of *sustainability*. The key to this transition over to the new principle is to move from the *domination* concept to the concept of *wise and responsible government*, based on the ethical principles of fairness and respect for the rights of future generations.

Throughout the 20th century, essentially production-based water management models have become dominant, differing in their characteristics, depending on whether the water resources were surface or groundwater. Although present trends recognise the indivisibility of the water cycle, and therefore tend to promote integrated models for surface and groundwater management, it is important to consider the background and major differences that have become firmly established over the course of the 20th century, thus conditioning the present situation and the prospects for the future.

2.a Supply-side strategies in surface water management

The liberal approaches of the 19th century in many European countries imposed a process of *selling off natural heritage*, involving the privatisation of lands, forests and natural resources - including water resources - as a result of the conviction that this was the only way for production to move forward. The development of large-scale infrastructures for irrigation and navigation of inland waterways under private initiative frequently ended in financial bankruptcies, as a result of the scale of investments and the long repayment periods that such projects demanded. This, together with the advisability of controlling the capacity of large-scale dams for hydro-electricity through the logic of *general interest*, led governments to take over their basic management, through an approach founded upon multiple objectives.

Legal framework:

While large hydraulic projects required the public ownership of water, some countries maintained the tradition of surface water as “common property”, used reasonably and equitably by riparian populations. Conversely, in most countries, shallow groundwater was considered as the private property of landowners. Today, however, there is a general European move to submit the right of use to licensing, regardless of status of ownership (either private or public). While integrated river and groundwater management entrusts the power of allocation to watershed partnerships, the “master States” become “guardian States”, increasingly drafting democratic legislation that gives priority to the needs of the ecosystem and to general interest uses.

At the beginning of the 20th century, and particularly after the 1929 economic crisis, most of the responsibilities for surface water management were under public control. The role of the State as promoter of major hydraulic projects spread, leading to the predominance of *supply-side* strategies through the construction of

major public works – which we term *hydraulic structuralism* - with public subsidies for the different uses of surface water (particularly in countries with traditions founded in Roman law).

Consequently, in different ways, and as a result of diverse traditions throughout the 20th century, a sense of the *general interest* of water management became the norm. This put the role of the State in the spotlight, guaranteeing the *democratisation* of access to water, as regards urban water supply, industrial uses and irrigation (especially in Mediterranean areas).

With the active support of the World Bank (WB), more than 45,000 dams were constructed during the second half of the 20th century, reaching a rate of between two to three major new dams per day in the 70s. However, in the 80s the rate slowed off and this model began to show clear signs of crisis, especially in the US and Europe.

Hydro-electricity production represents about 20 percent of all the electricity used in the world and as much as 50 percent of electricity produced in a third of all countries.

Another major objective of large-scale hydraulic works was to supply urban populations and industry, which today represent around 28 percent of water abstraction from rivers, lakes and aquifers (19 percent for industrial use and 9 percent for domes-





tic). It should be noted that these proportions are much lower in arid or semi-arid regions, where agricultural uses account for 80 to 90 percent of this abstraction.

Another important objective of many of the major dams that were constructed was to regulate floods. In many cases, however, this regulation has encouraged irresponsible and ill-advised invasion of the natural domain of rivers, actually increasing the risk of floods as a result.

Under the dominance of this *structuralist model*, the emphasis on quantitative aspects in Mediterranean countries has led to civil engineering holding sway in water management. In contrast, however, in central and northern Europe, given that urban water use is the most significant in terms of scale, the greater emphasis placed on qualitative aspects has led to more weight being given to sanitation engineering and public health.

Consequently, throughout the 20th century, powerful technical-scientific and administrative bureaucracies have gradually consolidated their position, one that is markedly hierarchical and closely related to the interests of major public investors in the sector.

2.b Groundwater for social and economic development

The fact that there have been limited investments for both drilling wells and also covering resulting operating costs, has given rise to situations where water management - and even ownership - remained in the hands of landowners in many countries, leading to a private water management model.

Technological advances and the accessibility of pumping techniques have led to mass-scale exploitation of aquifers, particularly in arid and semi-arid countries. Today urban water supplies for more than two billion people come from groundwater. However, it is mainly in the sphere of irrigated land that growth has been most spectacular. Millions of farmers have undergone what could be termed the *Silent Revolution* of groundwater-irrigated land. The costs of these decentralised technologies represent only a small fraction of the value of harvests, making it possible to take on board the criterion of *cost recovery* with little or no subsidies. But this *cost recovery* generally did not include the environmental cost, nor did it consider the sustainability of aquifers.

According to figures produced by the *Food and Agriculture Organisation* (FAO), the world's total groundwater-irrigated land amounts to about one third of the world's total irrigated land surface. According to estimates by the UN, in 2003 this irrigated land used scarcely 20 percent of the total water allotted for that purpose. However, this land produces around 50 percent of the economic value of - and employment generated by - irrigation farming. The conclusion is therefore that the technical efficiency of ground-

The cost of dams.

More than half of these dams were constructed exclusively or primarily for agricultural uses. The FAO estimates the total surface area of irrigated land worldwide to be around 389 million hectares, with a consumption level of between 2,000 and 2,500 km³/year. According to the World Commission on Dams, between 30 and 40 percent of that surface area is currently irrigated thanks to these large dams, and produces 10 percent of the food and fibre available in the world today.

water irrigation is, on average, twice that of surface water irrigation, while its *economic* and *social efficiency* is in the order of five times greater than that of surface water irrigation (which is heavily subsidised).

**Groundwater:
a safe source in arid regions.**

In recent decades the availability, accessibility and low cost development of groundwater resources has made it possible to offer good quality, safe drinking water to millions of people in developing countries lying in arid and semiarid regions. Simple and cheap pumping techniques have been utilised and backed, in particular, by UN organisations (WHO, UNICEF, UNEP, UNESCO).

Obviously these differences are not due to any intrinsic advantages of groundwater over surface water but rather to the management model used; a model in which users themselves pay for their demand. This has improved technical efficiency through the use of modern, pressurised irrigation systems and volumetric meters, boosting incentive to more active business approaches with greater added value.

However, excessive and uncontrolled exploitation of groundwater has often led to aquifer depletion and pollution, with significant social and environmental impacts which must be considered when assessing economic efficiency.

3. The crisis of prevailing practices and Supply-side Strategies

Over recent decades a set of new problems has led to a crisis in the predominant models of water management applied throughout the 20th century. These problems are as follows:

- The ecological crisis of water ecosystems;
- The unsustainable exploitation of many aquifers;
- Increasing problems regarding the quality of water resources;
- Problems of inefficiency and economic irrationality;
- Problems of governance: lack of transparency and citizen-level involvement.

3.a The ecological crisis of ecosystems and the collapse of the water cycle

As mentioned earlier, throughout the 20th century water development created valuable opportunities for economic growth, thus improving human living conditions all over the world. Nevertheless, over the course of time, current management models have encouraged spiralling demand that has exhausted the capacity of ecosystems, creating serious problems of unsustainability especially in arid and semi-arid countries.

The worldwide construction of more than 50,000 large-scale dams has disrupted the continuity of the vast majority of rivers and has drastically altered their natural flow, causing an irreversible impact upon biodiversity and geodynamic fluvial processes. Abusive diversion of water flow; major alteration of river courses; systematic felling of riverbank forests; desiccation of wetlands and mass-scale pollution have all had a serious impact, even leading to the death or disappearance of a significant proportion of





continental water ecosystems. Today, as reported by the Worldwatch Institute, continental water milieux record the highest number of extinct and endangered species in the biosphere. In spite of constructing thousands of dams aimed at reducing flood risk, in many cases the vulnerability of populations has actually increased in recent decades. Deforestation of headwater areas, along with dredging, channelling and rectification of many river courses, have increased erosion and accelerated fluvial dynamics, multiplying the destructive capacity of floods in low-lying areas of river basins.

The natural water cycle has been seriously altered on all continents, generating synergetic impacts, the grave consequences of which we are scarcely beginning to become aware of. In densely inhabited wet areas, such as central Europe, the intense *water-tightness* created in urban areas in a process of continuous growth, along with progressive deforestation and wetland drainage, are leading to growing regional desiccation. All these processes degrade the areas' natural water retention capacity, increasing river drainage towards the coast and flood risk. The synergetic effect of these phenomena is a dramatic fall in the humidity level in soil, and even in the atmosphere, triggering regional climatic change that requires major attention and thorough study.

Ecosystem degradation:
After the Aswan Dam was filled between 1965 and 1969, the Nile flow fell by 90 percent. The result was a decrease in primary production in the area of the delta and an 80 percent drop in Egyptian fishing activities. Specifically, sardine catches declined by 97 percent from 1962 to 1968 and shrimp catches by 86 percent from 1963 to 1969.

In arid or semi-arid river basins, as in Mediterranean countries, abusive water diversion produces serious salinisation and degradation of ecosystems, especially in estuaries and deltas. This frequently causes river mouths to dry up for months. This degradation of river flow has seriously affected sardine and anchoa fish stocks - species that during their egg-laying season depend on the flow of continental nutrients supplied by river-swell. This water, which fertilises life on coastal platforms, is particularly important in closed or semi-closed seas, such as the Mediterranean, which are poor in plankton.

In addition, sediment retention in large dams produces shrinkage of deltas and sand scarcity on beaches, supplied mostly by sediments of a fluvial origin.

3.b The unsustainable exploitation of many aquifers

The lack of public and collective responsibility, as a result of the individualistic model usually found in groundwater management, has frequently caused abusive water extraction, which in many cases leads to serious problems of degradation. This is sometimes irreversible and has serious socio-economic and environmental consequences: progressive salinisation, often by seawater intrusion; compaction and irreversible reduction of aquifer capacity; collapse and subsidence, with serious damage to infrastructures and housing; serious depletion of high quality fresh water reserves and/or degradation through generally widespread contamination; drying up or degradation of springs or basic river flow, and of lakes and wetlands fed by these aquifers.

Significant non-renewable groundwater resources are stored in deep aquifers in many parts of the world. Particularly in arid zones, such resources are often the only safe source of fresh water. However, uncontrolled exploitation of non-renewable groundwater reserves will create serious social and ecological problems for future generations, if adequate management and conservation plans are not established now. Alternative water sources (e.g. salt water desalinisation) must be envisaged for populations in these areas, diverting funds from current usage, in order to guarantee this future transition.

3.c The crisis of water quality and its consequences

All these phenomena, beyond their environmental impact, cause serious social and economic hardship worldwide, which dramatically affects impoverished and developing countries. The breakdown of the water cycle and the sustainability crisis of water ecosystems are seriously depleting renewal of available resources in terms of both quantity and quality. Poverty and ignorance, coupled with the irresponsibility of governments and international institutions, often complete this cycle of degradation and ecological crisis in aquatic ecosystems.

In Europe, although the consequences are not so tragic, water quality is at the centre of the EU's concerns. In central and northern Europe, as in many other industrialised regions, the breakdown in water quality has been the key problem for decades. The traditional use of rivers as evacuators of urban and industrial waste led to alarming situations which eventually motivated the development of technologies for effluent treatment.

Yet, when comparing the appropriateness of water pollution control and wastewater treatment requirements, we should take the natural conditions as the starting point. Instead of strict standards, (such as those applied in the former Soviet Union) we should, for instance, set minimum standards in terms of nutrients, depending on the characteristics of different natural environments.


Widespread nitrate pollution:

The EU drinking water target limit of 25 mg/l has now been exceeded by over 85 percent of agricultural areas in Europe at a depth of one metre below the ground, and the drinking water standard limit of 50 mg/l by over 29 percent. As a consequence, more than two thirds of European countries face serious widespread nitrate pollution of shallow aquifers, coupled by the resulting health risk.

Today, however, the impact of widespread contamination is increasingly serious. Contamination by nitrates, phosphates and pesticides, mainly from agriculture, have led to the paradoxical situation of increasingly contaminated rivers and aquifers, in spite of much greater efforts to purify and control industrial waste spillage.

The impact of widespread aquifer contamination by nitrates, organic chemicals and heavy metals which contain a major degree of inertia, requires long-term, costly and technically demanding processes of recovery. For this reason it is urgent that we begin to control contamination at source, and identify the aquifers which are still healthy, in





order to establish adequate protection policies. Compensation measures must be implemented for the population, especially farmers, whose economic activity is affected by restrictions in protected areas.

In the case of the European Mediterranean countries, as in the majority of arid or semi-arid countries, problems of quality - often gravely underestimated in contrast to quantitative aspects - are aggravated by the relative scarcity of water, especially where there is abusive abstraction from rivers and aquifers. Fortunately, this traditional lack of consciousness and attention towards quality problems has been changing over recent years, as a result of European policies and legislation.

3.d The lack of economic rationality in surface water management

Economic development during the second half of the 20th century brought profound changes which have led to negative cost-benefit balances for most major hydraulic projects, as recognised by the final report of the *World Commission on Dams (WCD)*. In addition, this balance between costs and benefits in new projects tends to erode under the inexorable *law of increasing marginal costs and decreasing marginal benefits*.

Another factor to consider is the relative loss of profitability in the agricultural sector: the profit from an increase in the productivity of irrigated land as a result of the *green revolution* has been lower in most countries than the *inflationary differential* experienced by the sector, with an increase in prices on their products which is far below that of general inflation rates.

The fact that the environmental impact of major hydraulic works, which have traditionally been ignored, has now been taken into account, contributes to the negative cost benefit balance we have today.

Another relevant element has been the perverse effect of generalised subsidies applied by these *supply-side* strategies, which have provoked *individual and collective institutional inefficiency and irresponsibility*.

Finally, the administrative opacity and excessive bureaucracy that has taken pride of place in promoting and managing this type of major infrastructure (even with well-publicised occurrences of corruption all over the world), has contributed to undermining the efficiency and economic rationality of surface water management.

The US Geological Survey:

In 1984, the United States Geological Survey, after making a detailed study of the 100 largest US dams constructed between 1920 and 1960, concluded that regulated water flow (properly used) in relation to the physical capacity of reservoirs had fallen to a 35th of its original total volume in that time. Within this process, the availability of increasingly fewer favourable locations for new dams, and the increasing distances and mountainous regions to be tackled, along with factors such as the poorer quality of land available for new irrigation, have all gradually undermined this cost-benefit balance.

3.e *The stumbling blocks of Governance: lack of transparency and community involvement*

The cultural and political changes implied by this change of direction from the *domination of nature* principle to the *sustainability* principle demand serious social debate and profound institutional changes. The question of water management requires the implication of society at large. The concept of *user* cannot continue to be limited to the traditional community of irrigators, electricity companies and the water industry (public or private operators). Rather, it must be extended to the general public and to nature itself. These necessary institutional reforms must do away with negative corporativism, bureaucratisation, and even the misgovernment that sometimes exists.

The concept of *general interest* must be reformulated on the basis of the key aim of guaranteeing efficient *sustainable management* of aquatic ecosystems and aquifers. Sustainable groundwater and surface management must be undertaken through an integrated approach, jointly with surface water, through organised collective responsibility on the part of the users themselves, and under the responsible supervision of public institutions, which must guarantee sustainability over and above private interests.

Modern water management must adopt an integrated, ecosystem-based approach at river basin level, superseding national borders, and supervised by appropriate international institutions. Moreover, traditional institutional models centred on conventional hydraulic engineering are insufficient. It is an interdisciplinary approach which is required.

3.f *Results: the debate over the use of hydraulic structuralism*

Over recent decades there has been extensive debate questioning the continued relevance of *supply-side* strategies based upon promoting major hydraulic works all over the world.

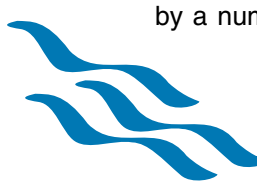
The US is the country in which the crisis of *hydraulic structuralism* and *supply-side strategies* appears in its most decisive and visible form. From the end of the 1980s, the official policy of the *Bureau of Reclamation* and other public US institutions has accepted the need to prioritise *demand management* and *conservation* strategies. In fact, at the present moment the rate of demolition of old dams (more than 500 up till now) exceeds that of new construction.

The Spanish Hydrological Plan:

One of the most recent examples was the citizen-led action against the National Water Plan in Spain, finally revised by the new government. Another undoubtedly more significant example concerned the lengthy and intense debate in the US in the 70s and first half of the 80s on this same subject.

In 2000, after a two-year study of hundreds of experiences on all continents, the WCD presented its *Final Report*. This report values the significant socio-economic achievements result-

ing from major hydraulic works, and at the same time reviews the dramatic forecasts by a number of international institutions on population growth: the number of human





beings with no guarantee of access to drinking water; the food crisis, and worldwide growth in electricity demand. On the basis of such forecasts, from a traditional development-focussed approach, it would appear to be necessary to persevere in the development of new infrastructures that would permit the use of greater river, lake and aquifer flows. Nonetheless, the report emphasises the key arguments that today question the validity of *supply-side strategies* based on major hydraulic works:

- Low efficiency and problems of economic profitability;
- Serious social impact and inequitable distribution of costs and benefits;
- Serious and frequently irreversible ecological and environmental impact.

The WCD has estimated the number of displaced persons as a result of the construction of large-scale dams to be between 40 and 80 million in total. (The number of indirectly affected persons, due to the breakdown of communities in areas around now flooded valleys is, in fact, much higher.) The most serious social and economic impact, in the WCD's view, has been upon the poorest communities and most vulnerable sectors, particularly women. Furthermore, the benefits derived from those projects have scarcely had any positive effect on these sectors.

The WCD finally offered the following set of recommendations:

- 1- The recognition of affected rights and risk assessment must constitute the basis for identifying affected social sectors. These sectors must be integrated within the decision-making process;
- 2- Transparency and public access to information must be guaranteed, as well as there being legal guarantees and attention paid towards the most vulnerable groups affected;
- 3- Essential decisions must be taken through consensus by the different stakeholders or affected parties, after a clear process of public negotiation;
- 4- Possible wide-ranging alternatives must be identified and the socio-economic values and environmental risks involved clarified, in order to define priorities;
- 5- Options based on *demand management strategies, saving and efficiency* must be prioritised. These must be implicit within plans for construction of large-scale infrastructures;
- 6- If, finally, the construction of major works is decided on, their design, development and management must adhere strictly to environmental and socio-economic principles.

4. Climate change and its consequences for water management

Growth in the use of renewable energy sources is often complicated, as the example of hydroelectricity shows, and this is also due to environmental reasons. However, even when renewable energy gradually replaces fossil fuels, climate change processes seem unavoidable and, in effect, are already occurring. The processes of *climate change*, due to the increase in greenhouse gas concentration in the atmosphere, are causing a gradual increase in temperatures and altering rainfall distribution in both time

and space. This process also entails an impact on the water cycle that will affect continental water masses and the ecosystems that depend on them. This situation must spur us towards fighting as much as possible against the causes of these phenomena and to anticipating suitable water management strategies for the future.

Climate change is affecting humidity levels in the soil and atmosphere and seriously altering river systems. In many places, the increase in temperatures is reducing snowfalls and increasing winter rainfall; both of which reduce the volume of flows in spring and in summer, while increasing winter water levels. The sensitivity of fluvial ecosystems to a wide range of climatic factors is in general significant, especially in arid or semi-arid areas.

There is broad consensus as to the foreseeable rise in average temperatures in the biosphere and there are relatively precise expectations as to the increase in evapotranspiration by plant life in general. This increase will substantially affect river levels and demand for irrigation, with particular effects on arid or semi-arid regions such as the Mediterranean.

Although scientific opinions differ on rates of change in rainfall levels in different regions, there is broad consensus over the general forecast of increasing variability in these rainfall levels which, in many places, will produce an increase in the frequency and intensity of extreme events of drought and river-swell. In the case of groundwater, this change is reflected in a reduced volume of recharge and consequently affects groundwater storage levels.

Water planning models have traditionally been based on average annual precipitation and river flow data. These prospects of uncertainty and increase in rainfall variability therefore require a change in mentality and the strategies for planning and managing this risk and uncertainty. The challenge we must take up is that of researching the complex responses of the water cycle and its ecosystems to these phenomena of climate change, urgently identifying the most vulnerable regions, in order to design and apply the right strategies.

The *principle of prevention* must underlie responses to foreseeable events. For instance, the growing demand for irrigation, arising from increased evapotranspiration, as a result of foreseeable increases in temperatures, must be resolved by suitable measures to apply this principle. Nevertheless, many of the elements of climate variability and the changes which are taking place, such as in rainfall patterns, are highly uncertain, invalidating reliable forecasts in space and time. Under these conditions, even if reliable forecasts cannot be made, a cautious, responsible and well-reasoned approach must be taken: it is a question of *managing risk* from the standpoint of the *precautionary principle*.

This uncertainty, coupled with the rather diffuse nature of the cause-effect relationship in this type of global climate phenomena, tends to favour certain attitudes at an individual and collective level, typified by the well-known *prisoner's dilemma*: *If the efforts each individual must make to solve the problem are not supported by others, they will be in vain; in the absence of shared, common agreement and in a*





context of mistrust, everyone will tend to decide on individualistic options similar to the ones they expect from others, thus collaborating towards constructing collective irresponsibility based upon mistrust.... Against this background, in spite of the lack of effective international institutions and unilateral attitudes, the Kyoto Protocol appears to be finding a way forwards.

Climate variability, with an increasing frequency of extreme events and the declining trend in precipitations in regions such as the Mediterranean, is tending to re-launch structuralist strategies that will increase regulation, riverbank reinforcement and channelling. This would be a mistaken manoeuvre. Through specific study of each region, the priority must be based upon restoring and conserving the ecological fitness of water ecosystems and their surroundings. The wetlands, lakes, rivers and aquifers constitute complex and flexible systems that are capable of absorbing and cushioning the impact of climate changes more successfully than inflexible and impressive strategies based on major new hydraulic works.

Proposals for a new wave of large-scale dams, in order to provide water resources in years of drought, must be assessed with caution. The high costs that can arise from seasonal regulation must be considered and their environmental and social impacts must be evaluated. It would therefore be advisable to review the annual pattern of traditional dam management to optimise its use in view of the new prospects of flood risk. Following a consistent approach to demand management strategies, the Californian experience with *Water Banks* (public water markets) can offer effective tools for managing these scarcity crises.

This being said, *demand management* and *conservation* strategies are the approaches that offer greatest flexibility and efficiency for managing periods of drought and flood risk.

5. The New Water Culture, as the expression of a New Culture of Sustainability

As has been argued above, adopting the *principle of sustainability* implies accepting an ethical and cultural challenge. To consider and manage these ecosystems as simple water channels or water stores is unacceptable, just as it would be to consider forests as simple wood stores.

5.a Water ecosystems: The Heritage of the Biosphere under public responsibility

Beyond economic uses or environmental services provided by water ecosystems, one should also be conscious of the vital role they play in the biosphere, as regards life on both land and sea. They should therefore be considered as the *Heritage of the Biosphere*. In addition, since continental fresh water is essential to the life of both human beings and nature as a whole, the management of rivers, aquifers, lakes and wetlands must be the responsibility of both communities themselves and public, local, regional, national and international institutions, in order to guarantee equitable and sustainable management on the basis of joint involvement.

5.b Re-focussing concepts and perspectives

Climatic diversity has traditionally been seen as a problem of “*hydrological imbalances*”, in time and space, introducing concepts such as “*surplus*” or “*deficit*” river basins or regions. From this perspective, traditional *supply-side strategies* have promoted major hydraulic infrastructures in the name of a supposed *general interest*, rarely contrasted following the criteria of economic, social and environmental rationality.

Through the *New Water Culture*, climatic diversity is seen as the wealth of the environment. Recognising and taking advantage of the opportunities provided by that wealth in each region, whilst also accepting the limitations this imposes, is the key to the design of *sustainable development* criteria in each geographical context. Just as it would be senseless to argue a *structural deficit of sunshine* in northern countries or *orographic (mountain) imbalances* in areas with a corresponding *deficit of flat, cultivable surface areas*, it is also senseless to understand rainfall diversity as an *imbalance* to be corrected through public financing and subsidies, whatever the cost.

The concept of *hydrological imbalance*, presented as an *injustice of nature*, has led to an ethical concept of *solidarity* on the part of water-rich regions or river basins towards those who have fewer water resources. This concept, however, is often used in a demagogic manner, in that it usually promotes the transfer of resources from less developed regions to other richer ones, aggravating regional and social imbalances.

The concept of scarcity:

On the Almeria coast of Spain, one of the areas of Europe with lowest rainfall, the use of the large Dalias aquifer has permitted major economic development. Today there are about 27,000 ha of greenhouses and a massive tourist industry that have provoked serious problems of scarcity due to abusive aquifer exploitation, with an average consumption of more than 3,000 litres per person per day, and further flows are demanded.

Scarcity must be understood as a condition created in most cases for socio-economic reasons, and not as a result of the lack of physical resources. Problems of scarcity are usually caused by abusive and unsustainable water use resulting from large-scale projects for economic development, rather than from basic use by a population. In such cases, scarcity must be managed using suitable criteria of economic rationality. From

the *New Water Culture* we propose prioritising the conservation of ecosystems in terms of each specific climate situation, promoting *balanced and sustainable development at regional and/or river catchment area level*.

5.c A new concept of quality

We must conceptualise and assess water not as a simple *productive resource* but as an *eco-social asset*, where the root “*eco*” expresses both *economic* and *ecological* values. For water management this implies a transition from a *resource-based approach* to an *ecosystem-based* one which is much more complex. The new EU Water Framework Directive accepts this new perspective.





Recovering the *good ecological status* of these ecosystems requires preserving the physical and chemical quality of water and taking care of the health of habitats. A living river, with its biodiversity, ensures a natural cycle of self-purification and active, efficient regeneration. Similarly, good morphological conservation of river courses, with their riparian ecosystems and adequate flow patterns, will essentially preserve the functionality of these river courses within fluvial dynamics, as well as the good ecological status of rivers.

From this perspective, *the polluter-pays* principle is insufficient. It is essential to develop new approaches to preventing *pollution at source*: it is much cheaper to avoid pollution or contamination than to decontaminate.

5.d New strategies based on water saving and demand management

The New Water Culture proposes a far-reaching change towards models based on *demand management* and *conservation* strategies. The essential key to these new models lies in recognising and accepting the limits of ecosystems' sustainability for which *demand management* strategies become decisive tools.

Saving and improving efficiency through modernisation processes must lead to releasing 20 percent of water currently abstracted from the natural continental water cycle and making it available for other uses. However, these modernisation processes, especially in irrigation, pose not only a technical challenge but also a major social, political and even cultural one. Modernising management approaches, changing mentalities and implementing new tariff strategies are some of the keys. Another challenge is financial in nature: although in many cases these investments are profitable from the point of view of ordinary market dynamics, the modernisation of urban water networks and irrigation systems, especially in developing countries, frequently needs and deserves financial support from national and international public institutions

Efficiency in water use:

The margin for improving the efficiency of different water uses is enormous:

- **In most city water supply systems, leakage levels are over 30 percent. Available technologies enable these losses to be reduced to less than 10 percent.**
- **Estimates as to the world's total irrigated land surface range widely. However, it appears clear that in most cases irrigated land hardly achieves 50 percent efficiency. Suitable modernisation of irrigation systems developed over the last 60 years would take us to efficiency levels of 80 percent.**

5.e Citizen-level participation as the key to good water governance

We are currently witnessing a complex process of globalisation in which public institutions are becoming debilitated: the achievements of the *welfare state* (widely developed in Europe) are being questioned; inequality is growing; and democratic principles appear to be weakened in the face of major transnational economic powers and the laws of the market. Public mistrust is on the increase, and serious problems of *governance* are appearing. The perception that real power is structured around the major transnational companies, over and above governments and parliaments, undermines

confidence in democratic institutions. At the international level, the UN is leaving world-wide leadership in the hands of financial institutions, such as the WB and the World Trade Organisation (WTO). Although these institutions are of a public nature, enjoying the formal support of governments, they lack a link which would give them legitimacy in the eyes of a society in which there is a growing conviction of dependency upon international financial elites.

Any attempt to guarantee *governance* in key areas, such as water management, requires strong citizen-level participation. The *Aarhus Convention* constitutes a commitment to environmental matters that defines a concept of *active public participation* understood as *pro-active participation* and not only *reactive*. On the question of water, the floor must be given to the new social partners who have been creating this movement for a *New Water Culture* over recent years: the ecological movement, groups of those affected by large-scale hydraulic works, users' and consumers' organisations, unions, and neighbourhood associations etc. On the other hand, this challenge of governance, along with that of accepting new sustainable management approaches at river basin level, requires far-reaching institutional reforms that must guarantee transparency, pro-active citizen participation and interdisciplinary approaches.

5.f Integrated management and new technologies

In 1992 the *Dublin Conference on Water and the Environment* rightly insisted on the need to develop holistic approaches of integrated water management. These new approaches must recognise and integrate the economic, social, environmental and cultural values at stake; they must encompass surface and groundwater management, and they must include quantitative and qualitative values.

Modern cleansing technologies:

The new membrane technologies (microfiltration, nanofiltration and inverse osmosis) have made processes of water reuse, purification and desalination possible at decreasing energy costs. These vary between 0.10 and 0.30 €/m³ to purify brackish or poor quality water, or even reuse city water, whilst seawater desalination today involves costs below 0.45€/m³, and energy costs under 3.5 kWh/m³, with prospects of a further reduction to 3 kWh/m³, according to the International Desalination Association. In spite of these costs, large scale river transfers proposed in recent years involve costs of over €1/m³ and 4 kWh/m³.

Eco-hydrology provides one of the most promising fields for technological advance in water management: it attempts to conserve the quality of resources, recovering the functionality of ecosystems, learning from nature itself and incorporating our technology suitably within fluvial dynamics and the natural water cycle.

The development of new technologies has brought improved efficiency and better quality water management, making the motto: "*do more and better with less*" a reality. Improving efficiency

can and must restrain the degradation of the ecosystems, opening up a margin of time for transition over to sustainable lifestyles. Nonetheless, when all is said and done, we must take up the challenge of altering our current values and our development model.





Leaving aside saving technologies (quantitative aspects), the most decisive progress comes today from membrane techniques (qualitative aspects) for desalinating and reuse, at very competitive costs compared with traditional hydraulic strategies.

5.g Cultural and aesthetic wealth and leisure value

Few elements have projected the symbolic, ritual and metaphysical values of mankind within its cultural traditions as emblematically as water has. Rivers and lakes are, moreover, our natural heritage, which have projected the values of regional and collective identity of the communities living on their banks and shores for hundreds or thousands of years. Traditionally these banks and shores have acted as meeting places for social life and areas dedicated to physical activities; bathing, fishing, sailing or simply strolling and contemplation. Unfortunately, over the course of just a few decades, thousands of kilometres of beautiful banks and shoreline have been lost. Today, through this *New Water Culture*, there is a growth in community groups who call for restoration of their rivers and are taking up the challenge to recoup and conserve this heritage, with its values of collective identity, memory, aesthetic beauty and quality of life.

5.h Sustainable and equitable management of cross-border river basins

From day to day the risk of conflicts over water grows. Historically, all human communities have traditionally settled on riverbanks and lakesides, or in the environs of springs and wells. Only in especially sensitive places, and in extreme circumstances of drought, exacerbated by processes of climatic change, can we talk of real problems of physical scarcity as regards covering the basic needs of populations. In actual fact, serious problems of scarcity generally arise as a result of abusive appropriation by certain social sectors or countries to the detriment of others.

As fresh water has gradually become a tool of power and business, international tensions and conflicts over water have been growing. Water is a banner with an enormous symbolic force that can be manipulated to incite confrontation between neighbouring peoples. However, such confrontations never result in effective and stable solutions in the medium and long term. *The New Water Culture* is a culture of peace, based upon the values of dialogue and involvement. It is therefore imperative that the UN give urgent impetus to legislation and to institutions with the necessary authority and resources to mediate in international conflicts over water and to pass binding resolutions where applicable. This is, in essence, a question of promoting an international legal order that will guarantee the bases of sustainable and equitable river basin management over and above national borders. Guaranteeing the sustainability of ecosystems and conservation of the natural water cycle, on the one hand, and ensuring an equitable distribution of available resources on the other, are two closely linked challenges.

5.i “Virtual water” and its potential

The “*virtual water*” of a product is the water used to actually produce it. The fact that it is cheaper to transport food (or other products whose production requires a lot of water) than the water that is needed to actually produce the goods, may lead to promising solutions to scarcity problems in countries with an arid or semi-arid climate. Reserving water to produce goods with greater added value, while importing goods that require intensive water use, would increase economic efficiency in the use of water available. However, these strategies must be incorporated within prospects of higher energy prices and transport restrictions on CO₂ emissions. In addition, the speed of transformation introduced by market dynamics may break down the social and production networks in rural areas, with serious and undesirable social impacts.

Unfortunately, pressures favouring unilateral international policies are undermining the confidence of many countries in this type of strategy. Since the embargo on basic goods (especially foodstuffs) may be used as a weapon against any country, the argument over preserving national sovereignty is now gaining strength and is thus debilitating confidence in strategies based on trading *virtual water*.

In any case, virtual water must be traded through procedures that prevent *environmental dumping*. If the WTO continues to block consideration of environmental values, the availability of cheap *water for economic growth* in developing countries, with no environmental regulation, may lead to increasingly abusive and unsustainable water use.

5.j A new ethics in water management: values at stake, rights and priorities

Discussion of the value of water often leads to confused debates and demagogic approaches. In fact, the diverse functions and uses of water are related to so many different scales of value that we need to distinguish different categories of the above, in order to establish suitable priorities, rights and management criteria. The classification of fresh water into “*green*” and “*blue*” water, used by the *World Water Council*, is insufficient. What is required is an acceptance of a clear order of priorities from an ethical standpoint.

Water for life, as regards its basic role of providing survival for both human beings (individual and collectively) and all other living beings in nature, must be recognised as high-priority and guaranteed *effectively* from the *human rights* standpoint.

Water for general interest purposes, as regards its role of preserving health and social cohesion, must be ranked at a second level of priority, under *responsible and socially efficient management*, and related to the social rights of citizens and the general interest of society.

Water for economic growth, as regards its role in legitimate economic development for production and private interest, must be recognised as a third level of priority, in connection with the individual right of all to improve their standard of living, and must be managed efficiently, following principles of *economic rationality*.





Lastly, illegitimate – if not explicitly illegal – production-based use of water is on the increase. Abusive exploitation of aquifers or irresponsible use followed by polluting waste are examples of this. Such uses must simply be stamped out through rigorous application of legislation.

6. Water for life

6.a Access to safe water as a Human Right

In developed countries, sanitation and sewerage, including the availability of reliable pressurised systems and treatment technologies, provide a safe water supply to all. This is not the case in most developing countries where, over recent decades, the accelerated implementation of the urban-industrial model has led to a serious health crisis in which water has become the main vector of disease. This is closely related to the crisis of rural resources and mass migratory movements to urban areas (often aggravated by wars and conflicts); population increase; unequal distribution of wealth and the increase in poverty; irresponsibility in urban and industrial waste disposal and other factors. Against this background, it is necessary to review the inefficiency and lack of willingness on the part of international institutions when prioritising efforts to solve these problems.

Water scarcity is often presented as the most serious issue of the 21st century. The problem, however, is not strictly one of scarcity in terms of quantity but rather of quality. We are, in fact, witnessing the tragic consequences of one of the most serious ecological crises ever known to man: *the ecological crisis of continental water ecosystems*.

In the long term, the solution must be centred upon the root of the problem: recovering the *good ecological status* of water ecosystems. Nevertheless, in the short and medium term, we must provide the necessary resources to guarantee access to drinking water for all: pressurised systems, chlorination, sanitation and safe sewage collection and disposal. The main problem lies in guaranteeing the necessary investments to construct, modernise, and maintain networks and systems, especially in the poorest urban districts, and to guarantee decentralised and effective systems in rural areas. It is calculated that one percent of current military budgets would be sufficient to finance the *“tap and drinking water revolution”*. It is therefore a problem of political will on the part of governments of the stakeholder countries themselves, as well as governments of the wealthiest countries and international institutions, since it is they who must face overall responsibility.

Public health and access to safe water:
Around 10,000 people a day - mainly children - die due to the lack of safe water and sanitation. If serious and effective commitments are not made in this regard, forecasts indicate that the problem will worsen, with forecasts of four billion human beings with no clean water by 2025. This has an especially negative effect on women, who are the ones who usually carry the water, take care of those who have fallen sick due to water-borne diseases, and who are often not empowered to make important decisions over water.

Recently, access to drinking water and sanitation has been recognised explicitly as a *Human Right* in *General Commentary no. 15* of the *UN Committee of Economic, Social and Cultural Rights* (2002). Such formal recognition clarifies or reinforces previous considerations which appeared in: the *Mar del Plata Action Plan* (1977); *The UN Convention for the Elimination of all Forms of Discrimination against Woman* (1979); *The Convention on the Rights of Children* (1989); and *The Dublin Declaration on Water and Sustainable Development* (1992). These principles are behind the adoption of the UN MDGs aimed at halving the proportion of the world's population who do not have water and sanitation by 2015, and Europe's own specific contributions to the MDGs, such as the EU Water Initiative (2002).

6.b The right of communities to the sustainability of their ecosystems

Frequently, *sustainability* is considered to be an *asset* widely found only in developed countries, and it is generally considered that the economic development of impoverished countries necessarily implies the environmental degradation of its natural heritage and resources as an inexorable tribute to pay. Such an approach is deceptive, unjust and unacceptable. Despite the fact that in developed countries certain polluting technologies have been used in the past, impoverished and developing countries should not repeat the same errors and marginalise the use of modern technologies and strategies available today. However, a lack of democracy fuels the possibility of polluting with no regulations against this in many countries. In this same vein, through the "*free competition*" approach established by the WTO, many companies which avoid dumping polluting waste in aquifers or rivers in the developed world, feel free to do so in these developing countries, practising what is known as "*environmental dumping*".

In the developing countries, where the social and health system is more fragile, the health and life of communities depend more directly upon the good state of water ecosystems. For that reason, the *sustainability* of ecosystems is more precious and necessary in these cases. Consequently, the *New Water Culture* calls for recognition of communities' rights to their lands and to the sustainability of the ecosystems on which their existence depends, as a *Collective Human Right* of current and future generations.

7. Water for general interest uses

The purpose of certain water uses is to produce services or goods considered to be of general interest to society. Urban water supply and sanitation represent a use of more significant general interest; however specific economic uses must also be brought into this section, with adequate debate and social consensus.

7.a Urban water supply services: the debate on liberalisation and privatisation

Water supply and wastewater disposal by sewerage systems and suitable sanitation constitute essential basic services in urban communities. In Europe, the strong





“municipal” tradition has led to solid collective commitments to guarantee these services to the entire population, and has required concerted efforts and major public investments to achieve a significant *local welfare state*.

The availability of quality water in unlimited quantities 24 hours a day and 365 days a year for multiple uses and at reasonable rates, beyond merely satisfying the human right to a basic share of drinking water, is indeed a conquest of public health, welfare and social cohesion. Access to these *services of general interest* must be recognised and guaranteed to all, as *citizens’ social rights*, based on *participatory and responsible management*.

Unfortunately, the gradual erosion of the culture of public issues, the growth in individualistic trends, bureaucratisation and growing international pressures to debilitate public institutions, both politically and financially, have frequently produced inefficient services and significant levels of individual and institutional irresponsibility. These problems, in settings of corruption and poverty, lead to dramatic problems of water supply and public health in many developing countries.

Over recent decades, the WB and the WTO have taken on increasing protagonism in these matters, impelling *deregulation and privatisation* of urban water supply services, following the *free market* principles which govern the current *globalisation* model. Furthermore, the increasing scarcity of quality water, along with the unavoidable need for domestic supply, ensures a preparedness to pay on the part of the public, which motivates business opportunities to manage these services.

All this has led to a worldwide broad-based and active debate as to the advisability or otherwise of liberalising management of urban water supply services, opening the floodgates to privatisation in many places. In any case, it is necessary to distinguish between *privatisation, liberalisation, and deregulation* processes.

In the context of this declaration, privatisation can mean at least three different things: the transformation of the legal status of the operator, the sale of public assets of this (historical/public) operator to private concerns, and the privatisation of water resources (through property and usage rights such as concessions). These three elements may be linked but this is not necessarily the case. Liberalisation, in turn, means the introduction of market mechanisms (*competition for or in the market*). Liberalisation and privatisation may be linked but there are no obligatory causal relationships between the two processes. Finally, deregulation means the reduction of state intervention (law making, bye-laws, etc.). Liberalisation processes very often imply re-regulation, meaning new rules and possibly a higher level of state intervention than before (e.g. creation of regulatory agencies, definition of public service obligations, regulation of third-party access, prices, consumer protection, settling disputes, etc.).

The arguments of the proponents of liberalising services

Liberalising the management of these services, and even market-based privatisation of water and its management, are usually justified on the basis of the following arguments:

- There are many examples of inefficient public management, while liberalisation, deregulation, and privatisation are associated with higher levels of efficiency through the incentive of competition. A number of examples are often given to support these claims.
- Public management is associated with inefficiency, while deregulation and privatisation are associated with higher levels of efficiency through the incentive of competition.
- The credibility of the private sector in financial markets can enhance the investment capacity for water services and infrastructure.
- The increasing complexity of water services requires technological capacities that can be developed with greater solvency by the private sector.
- On the other hand, suitable *re-regulation* in a context of *liberalisation*, guarantees the objectives and conditions of the service which public institutions stipulate as being in the general interest
- The independence of the regulator from both political authorities and operators improves control and quality.
- *Public-Private Partnerships* (PPPs) offer the possibility of collaboration between the private sector and public institutions without affecting public control of the service.

The arguments of the opponents of liberalising services

There are a number of counter arguments that question the supposed benefits of liberalisation and defend the advantages of a modernised and participatory public management system:

Private monopoly:

“When there is a risk that privatisation might create a monopoly, it is better to leave the services in State hands.”
[Vinod Thomas, Director of the World Bank’s Brazilian office referred to the case of Russia, a country which in recent years has had one of the worst performances in social terms, as an example of privatisation processes that should never have happened]
(Quoted in Folha de Sao Paulo, Brazil, 21st September 2003, p.B3.)

- There are many examples of highly efficient public management both in developed and developing countries, and numerous failures of liberalisation processes.
- The need to use one single network and the tendency to create vertically integrated systems impose strong rigidity upon the market, so that only the contract is competed for (i.e. there is competition *for* the market, not *in* the market) in a context of few market entrants and very long concession periods (i.e. 20-30 years). Thus, typically, a natural, long-term monopoly with no competition is established.
- The domination of just a few trans-national companies in the private water services market reduces much sought-after profits from a competition that in reality scarcely exists.
- The disproportionate power of these companies, in contrast to the financial weakness of many local public institutions, increases the well-known phenomenon of “*regulatory capture*”.





- The confidentiality rights of private companies create a lack of transparency and make control by the public difficult, even where there are regulatory bodies in place.
- The private sector is interested in service management (e.g. enhancing the commercial aspects of the business) but not in making heavy, long-term investments (e.g. in reducing leakage, renewing infrastructure, etc.), and protecting water resources (e.g. introducing demand management initiatives).
- PPP agreements reduce the level of real competition: even where a majority public stake is held in the property, management control is usually given to the transnational company, which will tend to block competition in secondary input markets (maintenance, technology, etc.) where most of the business is generated.
- Public companies operating in medium-sized or large cities have high technological capacity and operate with economies of scale which guarantee excellent services: in rural areas, which do not interest the private sector. These capacities can be acquired by local and regional organisations.
- The *free market* is not a suitable tool for managing social and environmental assets, and certainly not for preserving the rights of future generations.
- Liberalisation and privatisation tend to downgrade *citizens' rights* to *consumers' choice*.
- Liberalisation and privatisation are not needed to improve service efficiency. There are *tariff models*, "*benchmarking*" tools, and even public market formulas (*Water Banks*), which can help to modernise *public management*, thus encouraging elements of competition, rationality and economic flexibility.

In the awareness that this declaration may not reflect the wide-ranging positions held by the scientific and technical community, we launch a range of different proposals and suggestions to which we, the co-signatories of this declaration, subscribe:

- 1- Regardless of the management model adopted in each region, *human rights* must be guaranteed, as well as citizens' social rights to welfare and social cohesion. These must be considered over and above the criteria of market-controlled profitability. Therefore, essential water services must be recognised as a *service of general public interest*, not as a service of economic interest (e.g. the ongoing debate at EU level, prompted by the Bolkenstein initiative). The public should be made aware of both their rights and obligations in this field (i.e. water charges should increasingly reflect the multidimensional values of water, and this can only be legitimately achieved through public debate).

International situation:

"In setting the rules of the game, commercial and financial interests and mindsets have seemingly prevailed within the international economic institutions. A particular view of the role of government and markets has come to prevail – a view which is not universally accepted within the developed countries but which is being forced upon them and upon economies in transition."
(Joseph Stiglitz, former Chief Economist at the World Bank, 2002, pp. 224-5).

- 2- The question of liberalisation is of such breadth and importance that it requires wide-ranging debate in society as a whole, beyond the level of discussions in offices, city councils or parliaments. Liberalisation of such a vital service as water imposes long-term, far-reaching commitments, for which reason we consider that a broad-based process of public debate must be guaranteed. This would require meaningful citizen participation, possibly even through referendum or other available forms of co-decision making.
- 3- Guaranteeing access to drinking water and sanitation for all individuals and communities in the world, as a *human right*, implies a challenge of investment and financing that must be taken up by local, regional, and national governments and international institutions. The optimal solution is not to assign such responsibility to the market, due to its inherently short-term perspective on investment return. (It should be remembered that in Europe services of general interest for the entire population were achieved through public sector initiatives based on taxation, subsidies, and related “cheap-money” policies.)
- 4- Whether or not there is privatisation, there must be representative *public regulatory bodies* which effectively ensure transparency and stimulate citizen participation and social control, as well as guaranteeing compliance with social and environmental objectives and service standards, over and above private, partisan or bureaucratic interests.

The World Development Report:

“It would be wrong to conclude that government should give up and leave everything to the private sector. [...] If individuals are left to their own devices, they will not provide levels of education and health that they collectively desire. [...] Not only is this true in theory but, in practice, no country has achieved significant improvements in child mortality rates and primary education without government involvement. Furthermore, as mentioned earlier, private sector or NGO participation in health, education, and infrastructure is not problem-free –especially as regards reaching the poor” (World Bank, World Development Report 2004, pp. 10-11).

5- International financial institutions and OECD development agencies should review their strategies in this field and abandon their policy of conditioning the financing of basic investments in service infrastructure to the introduction of liberalisation and privatisation. There should be an acknowledgement that these forcibly imposed policies have often failed to deliver the promised results. In addition, far from guaranteeing the efficiency of public financing, they have in fact fuelled corruption, inefficiency, and social and political conflict, and have set back the implementation of much-needed programmes to support public sector water management (e.g. capacity building of local authorities and other relevant agencies to enhance their performance in the sector). Efforts should be centred on demanding democratic improvements, guaranteeing respect for human rights, controlling the use of public funds, and fighting corruption, whilst simultaneously promoting the adoption of best practice in integrated water resources management.





7.b Economic uses of “general interest”

As indicated previously, the traditional concept of *general interest* needs to be reviewed from the standpoint of *sustainability*, putting an end to the demagogic and presumptive use made of this term.

Today it is no longer acceptable to classify hydroelectricity production as a *general interest* activity, with no discussion as to the social and environmental impact it may cause. The significant and sometimes dramatic socio-environmental consequences of large dams, or the abusive proliferation of small-scale hydropower stations require specific debate on a case-by-case basis, in which the positive aspects of climate change are neither ignored nor made absolute.

By the same token, irrigation should not be accepted as a *general interest* activity without considering the particular operating model in question, or the environmental impact it produces. Nowadays agri-business, which causes serious environmental impacts and provides little value to rural communities in social terms, accounts for an increasing percentage of agricultural production and, in particular, irrigation use.

In contrast, traditional orchards and vegetable gardens, which are the basic livelihood of rural communities, especially in poor countries, can and must be considered as uses involving *water for life*, linked to the collective and individual *human rights* of those communities. In countries such as those of the EU, a significant proportion of family farms may be considered as producing assets of *general interest*, exercising *good practices*; these cases could deserve measures of support, following the criteria of *eco-conditionality*. But this must not imply traditional mass-scale subsidies on water that today provide incentive for inefficient irrigation, rather other measures of economic support which foster good practices.

It is therefore essential to redefine the concept of *activity of general interest* and to define how it is reasonable to support these activities through public institutions. *Social and political conceptual construction* is needed, through broad-based citizen participation, and from the perspective of the new assets and objectives imposed by the sustainability principle. Frequently the “*declaration of general interest*” for public works has been used as a way of avoiding debate over controversial projects; now, such declarations must motivate that debate, proving their justification through *pro-active* citizen-level participation.

Public intervention, using suitable economic tools, is certainly needed (rates, taxation, subsidies, etc.) in order to redistribute resources and guarantee the objectives of social justice and equity. But an effort must be made to identify the activities that deserve to be considered as of *general interest*, avoiding the assignation of public funds to subsidise private businesses which are not in the interest of society as a whole.

8. Water for economic growth

The water used in private business represents more than 50 percent of water abstracted from rivers and aquifers. One of the challenges we must face is the economic rationalisation of water management for these uses, guaranteeing, through public responsibility, the management of water ecosystems based on the solid ethical commitments of *sustainability and social fairness*.

The need to accept a *new economic rationality* does not imply adopting market dynamics. The complexity of managing socio-environmental values, those of land planning and third party economic interests, on the one hand, and the challenge of accepting the objectives of sustainability for future generations, on the other, make it advisable to keep under public control the management of water taken from nature for business uses. In any event, however, the application of the *cost recovery* principle, as a basic criterion of economic rationality, must be clearly accepted in the case of *water for economic growth* through adequate tariff policies. As regards this type of use, it is a question of avoiding traditional subsidies across the board, which cause unfair and undesirable consequences. This usually creates fierce controversy, especially over irrigation, as it is understood that this policy could ruin the agriculture of many countries and aggravate the problem of hunger in the world. Nonetheless, extensive experience of irrigation using groundwater (with exceptions such as India and Greece, where the State subsidises electricity for pumping) reveals that *cost recovery*, paid by the irrigator, is viable and has stimulated economic efficiency and profitability beyond the usual level for land irrigated with subsidised surface water.

Economic rationalisation, introduced cautiously and with social sensitivity, must promote responsible and efficient use on the part of the user and must be a tool for *scarcity management* capable of constructing models of *sustainable management*. It should be noted that scarcity is an inherent characteristic of *economic goods*. From this perspective, the price or tariff must be considered as a tool to moderate demand at sustainable levels, limiting the growth of current economic uses in many places.

9. The EU Water Framework Directive (WFD)

9.a The WFD: the challenge of sustainability in water management

The European WFD is one of most advanced examples of environmental legislation in the world. It adopts a number of approaches and objectives that we shall summarise in the following points:

- 1- As a central objective, it adopts an approach to ecosystem management which establishes the recovery and conservation of the *good ecological status* of rivers, lakes, estuaries and coastal waters and improved protection of wetlands. For aquifers, the objective of ensuring a *good quantitative status* is introduced, in addition to the *good qualitative status* demanded by previous legislation, taking into account the interaction of these water masses with wetlands and other ecosystems.





- 2- The *principle of non-deterioration* is expanded to all waters, deepening the commitment to conservation beyond *the polluter-pays* principle.
- 3- The river basin is established as the regional framework for water management, in recognition of the systemic structure of the natural continental water cycle. Taking on board the *indivisibility and integrity* of ground and surface water systems, the Directive furthers integrates management at river basin level, superseding borders in EU cross-border river basins and aquifers.
- 4- The WFD requires that deltas, estuaries and coastal platforms be integrated within river basin management, doing away with the traditional assessment that river water “*is lost to the sea*”, and recognising its important functions in the sustainability of deltas, beaches, fisheries and coastal ecosystems.
- 5- With respect to flood risks, the WFD alters the traditional infrastructure-based approach, to now prioritise the recovery of riverbanks, with the aim of recovering their capacity as a natural cushion against floods. The new slogan becomes “*give back space to rivers*”. Likewise, for periods of water scarcity, the improvement of natural water storage capacity (integrated management of aquifers) will be prioritised.
- 6- The WFD introduces new criteria of economic rationality in water management, governed by the *cost recovery* principle, including *environmental costs* and *scarcity value* (opportunity cost).
- 7- Finally, the WFD stipulates that water management be opened up to *proactive* citizen-level *participation*.

9.b Uncertainties and challenges in the process of implementing the WFD

The process of drafting the WFD required difficult consensus between the different governments, the European Parliament and the European Commission. In spite of the clarity of the principles and objectives, which guide the Directive, their broad margin of interpretation by governments and their technical complexity give rise to uncertainties, especially in the process of transposition to Member States’ legislation. We therefore consider that the European Commission should heed the following recommendations, in order to promote effective implementation of the WFD:

- 1- The European Commission should ensure strict application of the *principle of non-deterioration*, avoiding *fait accompli* policies during the transposition period. It would be wise to implement a *moratorium* on large-scale infrastructures, as well as on action that could endanger the objectives of the Directive, until environmental restrictions imposed by its enforcement have been clarified.
- 2- The WFD anticipates lower levels of environmental quality for so-called “*heavily modified masses of water*”. In these cases “*good ecological potential*” must be obtained (as opposed to a *good status*). Nevertheless, the fact that governments will decide which bodies of water are to be designed as *heavily modified*, along

with the right to repeal the objectives of recovering a *good ecological status* in order to temporarily or permanently reduce environmental demands, could take us to the point at which the *exception becomes the rule*. The European Commission should therefore oversee the application of these competences, in order to guarantee that the objectives of WFD are not downgraded.

- 3- The WFD introduces scientific and technical specifications in order to ensure that the definition and evaluation of *ecological status* is consistent and accords with common principles and procedures in all Member States. However, these specifications are taking shape on the basis of non-binding cooperation between governments and the European Commission. In particular, in Mediterranean regions, less available water may be used as a pretext to reduce environmental objectives, instead of restricting current abusive uses. On this point it is necessary to ensure rigorous scientific criteria which define benchmarks for a *good ecological status* in each geo-climatic context, in suitable conditions and using *benchmark* contrasts. The European Commission should ensure that the traditional biological methods used by member States to determinate ecological status are submitted to close scrutiny and that only methods that are fully compatible and complying with the WFD are accepted. International Scientific Evaluation Committees with independent expertise should be established for a review of this area.
- 4- Today, many governments are not guaranteeing the sustainable management of rivers and aquifers, and are protecting abusive operations and sometimes corruption and misgovernment. The European Commission must ensure that this recommendation-based approach does not lead us to a *de facto* degradation of the WFD objectives.
- 5- The lack of precision over the way in which governments must implement the *cost recovery* principle could lead not only to ineffective development of the principle but also to the contradiction that European funds are applied to projects that do not respect this principle. The European Commission should guarantee that such contradictions do not occur in managing these funds.
- 6- The new participation-based approach of the WFD should bring major institutional reforms in Member States. The European Commission must spur the adoption of these new principles of governance, through suitable recommendations and guidelines.

10. The challenge of giving a stimulus to this New Water Culture throughout the world

The economic crisis of the 70s and 80s gave rise to new strategies based on promoting competition as the key to increasing efficiency and productivity. Liberalisation of the labour market and financial deregulation were presented in this scenario as lines of action to overcome the crisis of Fordism. The collapse of the Berlin Wall, furthermore, opened up a new framework of *globalising* the economy under the hegemony of transnational financial powers, changing the nature of traditional competition within the framework of *nation*





states. The greater fluidity and availability of private capital within that framework of deregulated financial markets has been accompanied by strict regulation of public finances and strong budgetary restrictions. Against this background, there has been growing pressure towards privatising the management of natural resources such as water.

10.a Challenges and contradictions in European international policy

In a worldwide context in which inequality of opportunity is so evident, it is difficult to talk seriously of “*free competition*” and equitable relations of exchange. But beyond this fact, the practical application of these liberalising policies suffers from serious contradictions for which the EU has a major responsibility.

The pressure of external debt on the poorest countries favours a permissive attitude towards polluting industries, the importing of dangerous waste, and the overexploitation and exporting of their natural resources at low prices, producing the phenomena of *social and environmental dumping*.

Furthermore, subsidies on the production and export of agricultural products by the richest countries impose prices which break down the economies of the poorest countries. This distortion of the *free market* is reinforced by indiscriminate subsidies on irrigation water.

Finally, it should be noted that the WB has continued to finance the old “*supply-side*” strategies, promoting the construction of large-scale hydraulic projects in developing countries, often producing negative economic balances and high rates of financial risk, even in the face of well-founded complaints of violation of human rights and serious social and environmental impacts. When international social pressure has blocked this financing by the WB, the European *National Export Credit Agencies* (amongst others), have taken over to provide public financing in the name of the *general interest* to major European companies involved in those projects.

In this context, the supposed leadership of developed countries in *sustainable development* (reduction of CO₂ emissions, protection of biodiversity, conservation of aquifers and rivers etc.) is very often viewed with mistrust by developing countries as being problems on wealthy countries’ agendas, which threaten their sovereignty.

On the question of water, this mistrust is reinforced by the frustration at the failure of previous commitments, such as the one promoted by the UN in 1980 with the declaration of the *Water and Sanitation Decade* to ensure a minimum quantity of drinking water for all communities. Fifteen years later the target for 2015 was reduced to 50 percent of those who still lacked drinking water, as a result of the attempt to guarantee this human right.

10.b Towards a new international EU policy based on commitments to sustainable management of water ecosystems

Serious efforts must be made to reverse this tide of mistrust in the developing world but, at the same time, this requires intensifying the fight against poverty and in favour of a more just and equitable world order.

The EU must accept the responsibility of breaking down the state of international impotence generated by this syndrome of generalised mistrust that blocks the fight against *climate change*, dynamising the fulfilment and extension of the Kyoto protocol, albeit through unilateral decisions.

The EU can and must impel a multilateral world order based on an international legality that emanates from a renewed UN founded on democratic principles. From this perspective, and from the practical example of applying the WFD to our international river basins, the EU, through the UN, should promote international legislation and institutions with the resources and authority required to be able to mediate in and resolve water conflicts in cross-border river basins and aquifers.

Furthermore, only against this background, and with the appropriate international guarantees, will it be possible to develop the potential of “*virtual water*” trade in order to alleviate scarcity problems in many regions.

The consistent adoption of this perspective requires reviewing current EU and WTO policies and strategies, opening up a road of cooperation with countries that demand a more equitable world order and which criticise the discriminatory tendencies mentioned earlier. The EU must preach by example and reform its policy on agricultural subsidies, limiting them to rigorous social and environmental criteria. On the other hand, the principle of *cost recovery* envisioned by the WFD should be applied progressively but rigorously to agricultural water uses (with suitable compensation to family farmers who promote good practices). Through this rectification of agricultural subsidies, the EU could and should be willing to defend the new criteria of transparency in the international markets that will recognise the social and environmental values and counter-values which underlie production processes, as well as the values and risks relating to the nutritional quality of products. In essence, this is a question of promoting a globalisation model based on the ethical principles of fairness and sustainability.

It is foreseeable that the adoption of such changes in the WTO will mean rises in agricultural prices. Nonetheless, the social and environmental effects may be very positive if these increases fundamentally benefit family farming and less developed economies (based generally on agriculture). Furthermore, good agricultural practices would thus be given incentive and the quality of food would improve, with the corresponding benefits for human health. This is a question of recognising the true value of water, fertile soil, the environmental and social functions of aquifers and rivers, and nutritional quality and public health, as well as the value of preserving a balanced rural environment.

The principles of sustainability and participation-based governance of water accepted by the WFD can and must be valuable not only for the EU countries but for the entire world. The European Commission has, in fact, identified the potential of such principles at worldwide level and is incorporating them within its development cooperation programmes. The EU should accept, in all its dimensions, the responsibility of leading an effective programme that will guarantee universal access to drinking water within one decade, fomenting unified and sustainable management of water ecosystems, in col-





laboration with countries that wish to accept this challenge. However, this commitment must be developed wisely and humbly by:

- adapting action to the reality of different geographical locations realities, with the participation of local partners and supporting already existing capacities and programmes in each location;
- capacity building in order to develop regional abilities through active, unified citizen participation involving decentralised cooperation;
- conditioning any financial support for major dam projects to strict fulfilment of the *WCD* recommendations.
- promoting a *code for services of public interest* at international level that will guarantee the standards of citizens' rights which are analogous to those we defend for our own countries.

Promoting the restoration and conservation of water ecosystems and the hydrological cycle is the best way of preventing potential conflicts; facilitating access to good quality water in the poorest communities, and recovering the productivity of ecosystems as the basis for the subsistence of those communities.

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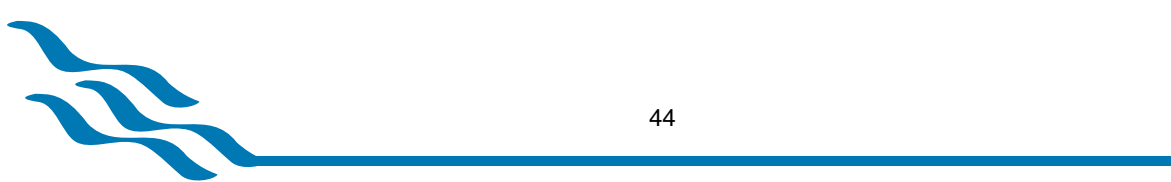
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2003 Acqua e Sviluppo, Bologna, Il Mulino, 2003.

2003 «The Role of Formal and Informal Institution in the Water Sector: what Challenges for Development» ? Forum Plan Bleu, on line(www.planbleu.org).

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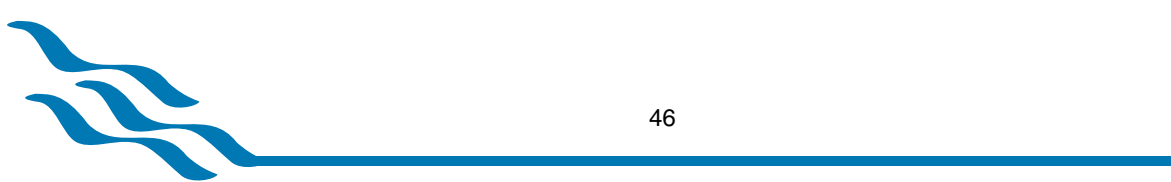
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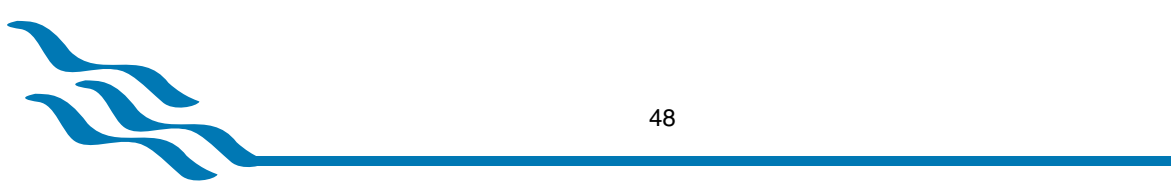
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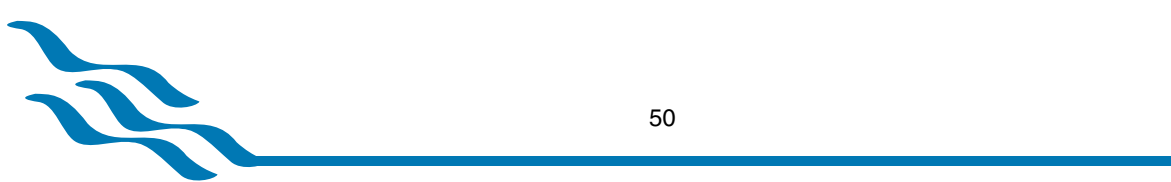
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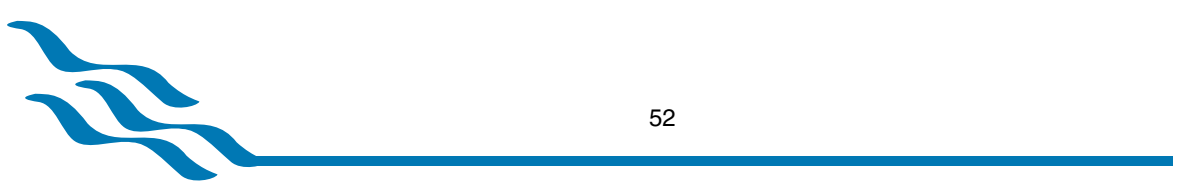


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- Asociata Romana a Apei
- Association pour le Contrat Mondial de l'Eau
- Associazione per la difesa de suolo e delle risorse idriche (gruppo 183)
- Ecologistas en acción
- European Centre for River Restoration (ECCR)
- European Rivers Network (ERN)
- European Union of National Associations of Water Suppliers and Waste Water Services (EUREAU)
- Focus Eco Center
- Fundación AVINA
- Fundación Ecología y Desarrollo
- Général Departement du Val de Marne
- Gobierno de Aragón-Instituto Aragonés del Agua
- Green Cross
- Greenpeace
- ICLEI, Local Governments for Sustainability, European Secretariat
- Instituto Geológico y Minero de España (IGME)
- International Water Resources Association (IWRA)
- Junta de Andalucía
- Mediterranean SOS
- Observatorio de los Servicios Públicos
- Prefeitura Municipal de Porto Alegre
- Secrétariat International de l'eau
- Solidarité Eau Europe
- The World Conservation Union (IUCN)
- UNESCO-Paris
- Universidad de Zaragoza
- World Business Council for Sustainable Development
- WWF/ADENA



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