



## Results of the 3<sup>rd</sup> regional workshop on water & sustainable development in the Mediterranean

Water demand management, progress and policies, Zaragoza, Spain, 19-21 March 2007

Synthesis document for the session of the Mediterranean Commission for Sustainable Development

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Information and talks presented in this document reflect under no circumstances the official point of view of the Mediterranean rim countries or that of the European Commission.

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# I. MANDATE, AIMS, ACTIVITIES AND PARTICIPATION IN THE WORKSHOP

The Fréjus workshop on “Water Demand Management” (1997) and the Fiuggi workshop on “Advances of Water Demand Management in the Mediterranean” (2002), organised under the aegis of the Mediterranean Commission on Sustainable Development (MCSD), showed the need to redirect policies towards water demand management, yielded materials on a series of case studies, and offered an opportunity to discuss policy implementation tools.

Following the unanimous call made at Fiuggi and the adoption of the Mediterranean Strategy for Sustainable Development (MSSD, 2005), the Blue Plan was tasked by the rim countries and the EU with organising a 3<sup>rd</sup> regional workshop on Water Demand Management (WDM) in the Mediterranean.

This 3<sup>rd</sup> regional workshop, entitled “Water Demand Management, Progress and Policies”, took place in Zaragoza on 19, 20 and 21 March 2007. Organised jointly by the Blue Plan and its regional partners in the field of water (the International Centre for Advanced Mediterranean Agronomic Studies, the Mediterranean Water Institute, the Global Water Partnership in the Mediterranean - GWP-Med -, MedWet and MIO-ECSDE), as well as Expo Zaragoza 2008 and the Mediterranean Agronomic Institute of Zaragoza, under the aegis of the MCSD, it was held thanks to the support of the Spanish and French Governments, the GWP-Med, the European Commission & the Mediterranean Action Plan.

The Zaragoza workshop brought together over a hundred participants (cf. list of participants in appendix 1). Fifteen Mediterranean countries were represented (representatives of national institutions, of academia, of the private sector and of associations). Moreover, the workshop benefited from active contributions by international organisations and financial institutions.

The Zaragoza workshop aimed at:

- taking stock of progress on implementing the MSSD water component measured against indicators;
- taking more detailed stock of progress on WDM: indicators and comparative water use performances (transport, distribution and use efficiency), identifying actual examples of good practices, analysis of policy instruments implemented and obstacles encountered;
- enabling a regional sharing of experiences;
- proposing ways to speed up the mainstreaming of WDM across water, environmental and development policies and regional and bilateral co-operation, develop and implement efficiency plans, and improve the system for monitoring/evaluating progress on water and sustainable development in the Mediterranean.

The workshop was based on the presentation of national reports carried out in volunteer countries, regional studies and papers selected by the Scientific Committee. The local and national studies aimed to document concrete examples of good practices and to measure the progress actually made over the last years in terms of:

- water demand management (WDM) in the main sectors of use (agricultural water, drinking water, industrial water),
- factoring natural water needs for the ecosystems into policies,
- factoring WDM into water and cooperation policies.

Were thus presented:

- national reports on “Monitoring progress and promotion of water demand management policies” prepared by 11 volunteer countries (Bosnia & Herzegovina, Cyprus, Egypt, France, Italy, Malta, Morocco, Spain, Syria, Tunisia and Turkey),
- in the framework of 4 thematic working groups (“Agriculture”, “Drinking and Industrial Water”, “Ecosystems” and “Water Policies”): among the 34 papers that were selected by the Scientific Committee and published (cf. appendix 6), 22 were presented at the workshop,
- 3 regional studies conducted on Mediterranean level, related to virtual water, the impacts of the Common Agricultural Policy mid-term review on water demand for irrigation, international cooperation and development aid for water.

The detailed programme is attached in appendix 2.

## II. WATER DEMAND MANAGEMENT: A MAJOR POLICY CHALLENGE

The Fréjus workshop of 1997 established a first general report showing that “the increase in the offer that was the traditional response to demand increase has reached or is going to reach its limits and is confronted with growing social, economic and ecologic obstacles in nearly all the rim countries”.

Indeed, the Mediterranean region groups together 60 % of the world population that is « poor » in water (with less than 1000 m<sup>3</sup> water/inhabitant/year), the resources are already overexploited in many places and the growing water demand is going to remain very high with the rise in the demographic rate in the south and the east, the development of tourism, industry and irrigated land. Climate change, with its already significant impact and the expected impact over the medium term on water resources and the irregularity of precipitations, represent a supplementary constraint that adds to the validity of this observation.

Taking into account the possible gains in efficiency, the MCSD had already concluded that water demand management<sup>1</sup> (WDM) should be considered as: « the way that will permit the most progress out of the Mediterranean water policies » and had drawn up the propositions chosen in the form of recommendations by the Contracting Parties to the Barcelona Convention (1997).

The Fiuggi workshop (2002) permitted the making of a first progress report, the documenting of a series of concrete WDM case studies and the debating of tools to implement these policies. It demonstrated notably that the most significant progress obtained was a result of a combination of tools (strategies, fixing of tariffs and subsidies, institutional organisation) implemented progressively and continuously.

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<sup>1</sup> Water demand management includes all the measures aimed at improving technical, social, economic, institutional and environmental efficiency in the various water uses. Water demand management is the main direction to help to reach two objectives at the heart of the concept of sustainable development: the evolution in non viable consumer and production methods on one hand, and the protection and sustainable management of natural resources with a view to economic and social development on the other hand.

The Contracting Parties to the Barcelona Convention adopted in November 2005 the « Mediterranean Strategy for Sustainable Development » (MSSD). The first priority field of the Strategy is improving integrated water resources and demand management with, for principal objectives:

- To stabilize water demand through the reduction of water losses and the wasteful use of water and increase the added value per cubic metre of water used,
- To promote the integrated management of watersheds, including surface and groundwater; and eco-systems, and foster depollution objectives,
- To achieve the Millennium Development Goals concerning access to safe drinking water and sanitation,
- To promote participation, partnership, active cooperation and solidarity for the sustainable management of water, at local and national level.

Currently, the stake is to accelerate the integration of WDM in the water, environment and development policies (notably in the urban and agricultural policies) and to help, if need be, the countries to design or improve their NSSD and « efficiency plans » the principle of which was decided on at the Johannesburg Summit. Better integration of the objectives of sustainability in the cooperation and development assistance policies is also both desired and essential.

Indeed, while the Mediterranean countries' demand should increase by about 50 km<sup>3</sup> by 2025 to reach about 330 km<sup>3</sup>, i.e. a level that is not easily compatible with the renewable resources, transport losses, leaks, misuse could be greater than 120 km<sup>3</sup> per year. That is why better management of water demand is of such great importance.

During the debates, the participants evoked ways of optimising the various water uses: for agriculture, industry and domestic, while taking into account the water needs of the ecosystems.

### **III. NATIONAL REPORTS ON « MONITORING PROGRESS AND PROMOTION OF WDM POLICIES »**

#### **1. CONTEXT, OBJECTIVES AND TERMS OF REFERENCE FOR THE NATIONAL REPORTS**

The Blue Plan was asked to help the Contracting Parties to build up information that would facilitate the implementing and monitoring of the MSSD and the National Strategies for Sustainable Development (NSSD). In 2006-2007, the Blue Plan has been mandated to gather together and distribute a set of indicators for monitoring the MSSD and to document these indicators, to carry out more in-depth analysis and to pinpoint good practices together with the volunteer countries.

Thus, the Blue Plan invited all the rim countries to prepare national reports on « Monitoring progress and promotion of water demand management policies » proposing terms of reference. These reports, supposed to be useful documents for the countries and for the region, had 3 main objectives:

- To inform about the water situation in the country, about current evolution and the likely consequences of the evolution;
- To demonstrate that progress is possible and essential in terms of efficiency but subject to the implementing of WDM instruments, to help the Mediterranean rim countries to improve their monitoring and progress assessment systems;
- To contribute to the Mediterranean reflection on the problem and to regional sharing of experiences about water demand management in relation to the territorial specificities.

#### **Box 1 Abstract of the national reports' terms of reference**

- Introduction: presentation of the country's main specificities (natural, demographic, socio-economic and institutional specificities),
- Major changes in the water situation in the country: supply, pressure on the resource and main degradation recorded, efforts underway to increase mobilisation of resources or reduce excesses in order to meet the Millennium Development Objectives,
- Improve efficiency in the various sectors of activity (agriculture, drinking water, industrial water) using the water demand management policies: indicators, retrospective and prospective analyses;
- Taking into account environmental objectives and integrating WDM into water policies: taking into account the requirements of the ecosystem and of the necessity to conserve resources, searching for optimal attribution of water among the uses,
- Taking into account of water demand management in the cooperation and development aid policies,
- Overview and conclusion: summary of the major objectives that the country has or will have, the indicators connected with them and the principal measures that could be proposed to clear the hurdles.

## **2. MONITORING INDICATORS OF THE MSSD WATER CHAPTER**

The analyses presented in the national reports were backed up by the available statistics and indicators. The countries were thus invited to inform the indicators of monitoring the MSSD “Water” chapter indicators (5 priority indicators and 14 complementary indicators; see lists of indicators in appendix 4) by taking into account the definitions appearing in the descriptive sheets of the indicators attached to the Terms of Reference, while specifying, if any, the definitions used in the country.

Indicators fact sheets for 4 priority indicators (water demand, exploitation index of renewable natural resources, share of the population with access to an improved water source, share of the population with access to an improved sanitation system) are attached in appendix 5.

The monitoring of these indicators highlights the main trends observed concerning the evolution of the water demands and the pressures on the resources, as well as the efforts made to achieve the Development Millennium Goals.

The evolutions of the demands are alarming because incompatible with those of the availabilities of water in the majority of the countries. The increase in water demand in the Mediterranean is primarily due to irrigation water demand which remains the major user of the water resource in the countries of the South and East. The exploitation index of the renewable natural resources shows a strong pressure on the water resources in particular in Egypt, Malta, Syria, Libya and Israel where water abstractions are close to, if not exceed, the limit level of the renewable resources.

The proportion of the Mediterranean population having access to an improved water source is on the increase and was at over 80% in most of the countries in 2004 (that is, a value close to the world average of 83%). The figure of 30 million Mediterranean population which did not have access to drinking water in 2000 was down at about 20 million Mediterranean persons in 2004. However, the situation remains less favourable in rural zones, in particular those of the Eastern and Southern countries, where the largest proportion of the Mediterranean population without access to drinking water is found. Besides, if the proportion of the population having access to an improved sanitation system is also on the increase and now exceeds the world average (59%), about 47 million Mediterranean persons still did not have an adequate sanitation system in 2004. The disparities between Northern countries and Eastern and Southern countries, on the one hand, and between urban areas and rural areas, on the other hand, are quite pronounced in this part.

### 3. MAIN ACHIEVEMENTS AND GAPS HIGHLIGHTED IN THE NATIONAL REPORTS AND IN THE WORKSHOP DISCUSSIONS

11 volunteer countries (Bosnia & Herzegovina, Cyprus, Egypt, France, Italy, Malta, Morocco, Spain, Syria, Tunisia and Turkey) have carried out a national report on « Monitoring progress and promotion of water demand management policies ».

The presentations of these reports at the workshop, as well as the discussions having followed them, made it possible to highlight the reality of the progress made since the Fiuggi workshop in matter of taking into account the WDM in the water policies and certain sectoral policies (cf. examples in boxes 2 & 3). It has emerged that strategy documents, legislative texts or national law increasingly refer to the WDM and, this, either explicitly or, still too often, in an implicit way. It should be recalled that the 1<sup>st</sup> of the 8 recommendations made at the Fiuggi forum called upon Mediterranean countries to define, adopt and implement national strategies and institutional mechanisms for the WDM<sup>2</sup>.

#### **Box 2 Water saving in the industrial sector in Morocco: Case of the use of flow control valves for cleaning operations in a pork-butcher plant in Mohammedia**

**Current situation:** The cleaning water of the factory shops comes from a well. The quantities used for cleaning based on classic hoses are excessive. The personnel is little sensitised.

**Scope of the project:** To equip the manual cleaning hoses with flow reduction heads and build awareness of the personnel as to the need to reduce water consumption.

**Investment:** 9 000 Dh (acquisition of 30 flow controls valves)

**Expected gains:** Saving 286 000 m<sup>3</sup>/year of water, that is 318 700 Dh/year

Saving power energy: 26 000 kWh/year, that is 2,2 Toe/year

Financial gain: 318 700 Dh/an

**Return time-period:** 1 month

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<sup>2</sup> National governments were also invited to support the adoption of WDM by local organisations (creating the political and administrative conditions necessary to the emergence of water citizenship) and to publish and implement the MCSD's work and recommendations (organising inter-ministerial meetings and ensuring that the results are made known to the major organisations involved in the water sector).

### **Box 3 Factoring the water demand of natural ecosystems in any water resources development policy: Case of Ichkeul in Tunisia**

Like almost all lagoons around the Mediterranean basin, the lagoon-lakeside system of Ichkeul is under threat due to the socio-economic pressure exerted on it. The medium is indeed in the process of a drastic change induced mainly by the construction of dams upstream the catchment area (Joumine, Ghézala and Sejnane) which will lead to diverting a large volume of water initially flowing into the Ichkeul. This reduction of inflows will induce an imbalance of the water functioning of the lake-marsh system, with risks of increasing water salinity and gradual disappearance of the specific vegetation which feeds the water birds.

In order to address this mismatch between environment and development, several measures were decided in order to ensure conservation of Ichkeul:

Construction and operation of the lock-gate on wadi Tinja to the fresh water inflows and better manage the water exchanges with the Lake of Bizerte,

Updating the North and Far North Water Master Plan in order to integrate the National Park Ichkeul as a fully-fledged water consumer. The environmental demand of Ichkeul was met back in 2003 with the conveyance of 100 mm<sup>3</sup> from dams in the vicinity (Sidi El Barrak, Sejnane),

Construction of the urban wastewater treatment plants of Mateur and Menzel Bourguiba in order to improve the quality of the water supply into the Ichkeul.

The Mediterranean countries must, however, face new challenges. Underscoring the difficulty of meeting an increasing water demand in a context of insufficiency, rarefaction, if not overexploitation, of water resources (likely to be exacerbated under the effect of climate change), as well as of alarming deterioration of water quality, the national experts at the same time reminded of the factors having motivated, sometimes in an early manner, the implementation of WDM measures in their country<sup>3</sup> and outlined the main obstacles still hindering a concrete implementation of WDM policies and strategies. These obstacles and hindrances are of various sorts: institutional constraints (scattering of responsibilities and lack of coordination between ministries involved in the management of water resources), lack of integration of the various policies (water and sectoral policies), absence of a legal framework, lax control, inadequate water pricing, lack of public awareness of the need for water saving, lack of involvement of the users in water resources planning and management, lack of qualified staff in charge of water management, lack of financial capacity of the States, which impedes the implementation of the national plans for an integrated management of water resources and water demand (implementation remaining dependent on national budget prioritisation), etc.

### **Box 4 Main impediments to implementing the WDM approach in Syria**

- Lack of coordination between the ministries involved in the management of water resources,
- Existence of contradictory policies: the policy of assistance to the farmers towards the purchase of modern irrigation systems is, for instance, not coordinated with the pricing of irrigation water (rates according to irrigated area, not to the quantity consumed, thus not conducive to water saving),
- Lack of staff qualification (as regards the technical and administrative aspects),
- Wastage of drinking water due to a lack of awareness among the citizens - as a result of low water price - about the importance of and need to preserve this scarce resource.

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<sup>3</sup> For instance, in Cyprus: early implementation of WDM strategies due to the very high cost of development of the offer; in France: implementation, as early as the 60s of the principle of water management by basin and development of the notion of WDM by usage, pursuant to the Water Law of 1992.

Several countries have availed themselves of the various tools at their disposal (technical, legislative and legal, institutional, economic, planning and concerted action, training and awareness-raising...) in order to make headway in the field of the WDM, or are wishing to further develop these tools. The relevance and efficiency of the economic tools, still insufficiently used though playing a key role in matter of aligning the policies with WDM requirements, were particularly underscored. Specific reference was made to incentive economic mechanisms encouraging agricultural water saving (decoupling of the EU agricultural support from production, agro-environmental measures and cross-compliance, rate setting and quota systems), establishment of water accounts as a strategic tool for inter-use reallocation (on national level or on catchment area level), cost-effectiveness analysis and economic analysis of the various water uses. The pricing issue, though remaining a very sensitive issue in all Mediterranean countries, has emerged as one of the priorities (if not *the* priority) of WDM strategies. It is indeed necessary to manage to achieve a gradual cost recovery (the EU Water Framework Directive requires full recovery of the water costs) while seeing to social equity. The participants in the workshop have, in this regard, underscored the need to address with users' associations the issue of the water price, to help the various users to install water saving systems (box 5) rather than subsidizing the water price, to assign a price to all the water resources of the country (both surface water and groundwater) and to implement a special rate for re-used water. The need to use planning and concerted action tools, allowing the definition of objectives that are common to and appropriated by all the players, also was particularly underscored, and several innovative and positive examples were mentioned<sup>4</sup> (Box 6). These planning and concerted action tools need to be developed on various territorial levels (national, regional and local).

#### **Box 5 Subsidies for water conservation: the case of Cyprus**

Well drilling for garden irrigation (670 US\$): Subsidy for well drilling for home gardens for households connected to the water distribution networks of all municipalities and villages (subject to well permit and inspection of site after permit and before drilling).

Connection of well with lavatories (from 200 to 700 US\$ depending on the number of households connected): The subsidy covers connection of wells with home lavatories, schools, offices, shops, institutes etc connected with distribution networks of all municipalities and villages for the purpose of conserving drinking water (estimated up to 28%) that is used for lavatories (subject to application, inspection and provision of technical advice by WDD).

Installation of a system for the recycling of grey water (1375 US\$ for each homestead and 60% of the cost for the installation of such a system for the rest of the cases): The subsidy covers installation of a system for the treatment of grey water and its reuse in lavatories and garden irrigation of a household, school, playing grounds, swimming pools, gyms, hotels, industries etc., connected with distribution networks of all municipalities and villages. Grey water is the water that comes from bathtubs, shower, wash-basins, cloth-washing machines, water from vegetable and fruit washing. The saving of water is expected to be about 33% (subject to application, inspection and provision of technical advice by WDD).

#### **Box 6 Examples of planning and participatory tools implemented in France**

The implementing of the 1992 Water Law led to the drawing up of a guiding scheme for planning and managing water at the basin level (Schéma Directeur d'Aménagement et de Gestion des Eaux, SDAGE) defining the directions of the management and planning of the basin for a period of 10 to 15 years. In the sub-basins, the scheme for planning and managing water (Schéma d'Aménagement et de Gestion des Eaux, SAGE), supported by local bodies, is the tool for managing and protecting water uses and resources.

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<sup>4</sup> Concerted management with agricultural users within collective entities, Development and Water Management Schemes allowing the design of tools to arbitrate conflicting uses on the level of a sub-catchment area (France), water saving charters in the tourist sector signed by certain hotel-owners' groups, etc.

The River Drôme « SAGE » (initiated in 1992), led by all the water users, made it possible to implement a global framework limiting water demand for agricultural purposes by the freezing of irrigated land, to supply water from the Rhone in the downstream part, to respect an instream flow and to develop a network for measuring the stream flow in real time to keep the managers informed.

For the EU Member States, it has emerged that the Water Framework Directive (WFD) has had a particularly decisive effect on accelerating the adoption of WDM in the water policies (via mainstreaming the principles of management on catchment area level and of involvement of the various users in the planning, development of approaches to environment protection in order to achieve the objectives set by the Directive - of which observance of a proper ecological state of the water bodies -, requirement to reach full recovery of water costs, etc). The WFD thus proves to contribute some new "know-how" which could be inspiring to EU neighbouring countries.

The Southern and Eastern Mediterranean countries have underscored, on the other hand, the need for boosting international co-operation and scaling up development aid in support of the implementation of WDM strategies and approaches.

The exchange of views has, in the end, highlighted the need, for all decision-makers:

- to improve knowledge of the water resource and, for this purpose, to have reliable, comparable and regularly updated information,
- to take into account such global developments as climate change and, in particular, to update the prospective scenarios related to water resources, water demand and potential water saving by integrating the climate change factor,
- to connect the water issue with that of energy.

## **IV. FACTORING WDM INTO SECTORAL AND WATER POLICIES: PAPERS PRESENTED IN THE FRAMEWORK OF THE THEMATIC WORKING GROUPS**

### **1. OBJECTIVES AND CONTENTS OF THE CALL FOR PAPERS, SELECTED PAPERS**

A call for papers was launched to document concrete examples of good practices and to measure the progress actually made over the last years in terms of: water demand management in the main sectors of use (agricultural water, drinking water, industrial water), factoring natural water needs for the ecosystems into policies, as well as factoring WDM into water and cooperation policies. The objective was thus to favour the sharing of Mediterranean experiences and, ultimately, to promote the mainstreaming of WDM across the different policies.

34 papers were selected by the scientific committee and published (cf. appendix 6), 22 of them were presented at the workshop in the framework of the thematic working groups (cf. appendix 2: workshop's programme).

## 2. CONCLUSIONS AND RECOMMENDATIONS OF THE THEMATIC WORKING GROUPS

### 2.1. Thematic working group « Factoring WDM into the agriculture sector »

Key messages of the presentations and discussion can be summarized in three main points:

- Concerning the integration of the objectives of WDM into the agricultural policies: it is important to integrate environmental issues in the sectoral policies, in general, and in the agricultural policy, in particular. This process requires new tools for monitoring and evaluating the effectiveness of such integration in order to overcome the existing difficulties: limited availability of the data, the complexity of the policy tools, the problem of the scale.
- Concerning institutional aspects and capacity building: a stronger regional partnership is needed to support dissemination initiatives and sharing knowledge on water demand management. It is important to continuously monitor the implementation and effectiveness of the Institutional Reforms adopted in many Mediterranean countries.

The new information technologies can contribute to improve WDM at basin level. Their effectiveness can be higher if participative and endogenous processes are implemented to build innovative tools of water management.

- Concerning the improvement of participative water management: water users associations have to be further supported and solutions well adapted to the local context have to be implemented.

#### **Box 7 Recommendations of the working group « Factoring WDM into the agriculture sector »**

1. Increase water demand management actions in Mediterranean Agriculture by taking into account: technical aspects (new technologies and innovation) and governance aspects (decentralization, users participation, education, training),
2. Integrate a more sustainable WDM into national policies (by clearly identifying priorities and responsibilities) and regional sectoral policy (agricultural, educational, energy) considering the local conditions (i.e.: food security for non EU countries),
3. Go on the way of « decoupling » agriculture support from production as an effective tool to achieve positive environmental effects,
4. Support the dissemination and sharing of experiences (both among different countries and within the same country) of WDM policies actions in all Mediterranean countries. Ensure an interface between science and policy,
5. Monitor the achievements of the different policies in terms of WDM by identifying appropriate and shared/recognized indicators.

### 2.2. Thematic working group « Factoring WDM into drinking and industrial water management »

Key messages of the presentations and discussion, reaffirming the relevance of the recommendations proposed in Fiuggi, can be summarized as follows:

- Concerning standards and regulatory aspects:

Auditing procedures for the facilities and systematic control of withdrawals should be imposed.

The regulations should also incite checking and measuring of individual consumption and even impose this.

The implementing of stricter quality standards for the equipment used for storing or distributing water should be imposed, even if their application is progressive.

« Water saving » labels should be attributed to the entities which are great water consumers, especially in the tourist sector, if these entities respect a list of specifications.

The implementing of ISO 224 standards would help to create an institutional framework favourable to the setting up of a WDM policy.

- Concerning the social and economic aspects:

Water pricing is a very effective WDM tool. It should be adapted to the context of each country and reconcile the awareness of the real cost of water, the ability of citizens with low financial means to pay « basic » consumption and a real encouragement to save water.

The setting up of targeted subsidies aimed at permitting or encouraging action that is considered relevant for water saving or to develop equipment adapted to this policy.

It is necessary to set up measures for awareness-raising about water savings in each sector of activity. If behaviour is to be altered in a sustainable way, it is essential to implement voluntary policies for education about water and the environment.

The social and economic components are the key factors that contribute to solving the problems of urban and outlying areas. In this respect the example of the National Initiative for Human Development in Morocco has highlighted the fact that the joint mobilising of financial means and individual capacities has helped to meet the needs of low income populations.

- Concerning the technical aspects: new technologies and new concepts:

This underscored the need to:

- Harness new information and communication technologies : Internet, advanced telephone technology, information and data management systems in all the fields contributing to demand management (knowledge of consumption and uses, customer communication, and so on),
- Take into account of new concepts that have now reached an interesting stage in terms of feasibility and credibility, such as the using of grey water, the storing of rainwater, the recycling of some types of water,
- Recourse to new equipment and materials designed to save water in homes and in the hotel and catering industry.

Special emphasis will be placed on the « meter » policy associating new technologies for « intelligent meters ».

**Box 8 Recommendations of the working group « Factoring WDM into drinking and industrial water management »**

1. Take an initiative to adapt ISO/TC 224 standards (service activities relating to drinking water supply systems and wastewater systems) to the Mediterranean context,
2. Take an initiative to ensure better coordination among donors, as well as the complementary nature of their strategies, in the financing of WDM actions,

3. Raise the education component to the rank of the other WDM instruments and commit water service managers to devoting sufficient financial and human means to this education,
4. Besides applying techniques that have been known for a long time, such as the reusing of waste water, it is recommended to systematically search for what type of support the new technologies could contribute to global WDM policies.

## 2.3. Thematic working group « Factoring natural water needs for ecosystems into policies »

Key messages of the presentations and discussion can be summarized as follows:

- An integrated approach to water management is of great value for considering ecosystem needs. It is crucial not only to look at « water as a resource », but to understand the importance of water for complex ecological systems. Appropriate water quantity and quality must be provided to ecosystems for sustaining their functions, taking into account their natural dynamics.
- Different tools and methods for a better understanding of ecosystem functioning were mentioned: pressures analysis (as a starting point and linked to the WFD approach), functional analysis, economic instruments, risk analysis (e.g. in the context of climate change), Remote Sensing for understanding the evolution of vegetation in response to water level fluctuation, approaches from Ecohydrology as well as impact assessment studies.
- Scientific knowledge must be translated into clear management objectives adopted by the policy makers. The economic valuation of ecosystems (e.g. wetlands) and related services can be very useful to make the ecosystem needs considered as a priority.
- Local solutions utilizing local knowledge are needed for sustainable, integrated management and ecosystem protection.
- The importance of regional cooperation in the Mediterranean to improve the understanding of ecosystem functioning, as well as the adoption of methods and management tools integrating water needs for ecosystems, was stressed. The developed practical approaches in support of the WFD implementation in the EU member states (e.g. horizontal guidance document on wetlands) can be very helpful for water managers, also for countries that are not required to implement the WFD.

### **Box 9 Recommendations of the working group « Factoring natural water needs for ecosystems into policies »**

1. To promote the factoring of the natural water needs of ecosystems via an integrated water resources management approach on (sub) catchment area scale,
2. To develop the scientific tools and methods necessary for a comprehensive understanding of the functioning of the ecosystems and to translate this scientific knowledge into management objectives listed in the planning documents. This requires, in addition, to take into account the specificities (not only the natural, but also the socio-economic and geopolitical, specificities) of the region and of the Mediterranean countries,
3. To develop the economic approaches and mechanisms likely to promote recognition of the services rendered by the ecosystems and, hence, the sustainable management of these ecosystems,
4. To foster the participation of the local players right at the outset of the first phases of the water resources planning and management processes, and this, in order to facilitate recognition and integration of the environmental water demand.

## 2.4. Thematic working group « Factoring water demand management into water policies »

The presentations and the discussion made it possible to highlight the following elements:

- Need to combine various tools to implement integrated WDM policies. The importance of the economic approach was reiterated (paramount importance of water pricing and the instating of fees to encourage water saving and ensure solidarity of the users of the resource, valorisation of the economic dimension of the involvement of women in water management, cost-effectiveness and cost-advantages analyses for the choice of measures fostering the enhancement of environment quality and of WDM), as well as that of the tools of concerted action bringing together the public operators (State, communities), the economic life stakeholders and the general public.
- The importance of the set up of collective entities and of participatory management (agricultural users' associations, domestic users' associations) and the need to promote, in particular, the involvement of women, who are the main users and responsible over the water resources, in the decision-making and planning processes.
- The WDM principles need to be available on the various territorial levels. The purpose is to particularly promote ownership and implementation of WDM approaches by the local stakeholders (water services, local management on catchment area level).
- The operating costs to ensure the missions of information and coaching of a policy of water saving and control over consumption are high. The implementation of WDM approaches assumes, in view of the significant number of stakeholders to be mobilized, the availability of dedicated means to inform, sensitise, educate, persuade, and allow the sharing of experiences;
- The climate change factor, making it even more crucial to implement WDM measures, needs to be mainstreamed in the water resources planning and management.

### **Box 10 Recommendations of the working group « Factoring WDM into water policies »**

1. Integrate water demand management into the water and sectoral policies, on different territorial scales. The WDM policies will be based on the widest complementary of the available mechanisms (laws, planning and local action instruments, water police, actions at user levels, water pricing, information, education and awareness-raising actions, technical and technological measures, etc.) ;
2. Involve local stakeholders in the WDM processes: set up an institutional framework making it possible to empower local stakeholders and help them to appropriate the WDM procedures;
3. Develop the economic approach of WDM (water accounts, water pricing that in particular integrates mechanisms in order to reach a progressive recovery of costs whilst at the same time ensuring social equity, cost-benefit analyses, etc.). The methods and tools for the economic analysis of the Water Framework Directive could serve as inspiration for neighbouring countries when implementing their WDM policies.
4. Integrate the « climate change » factor in the water resource management strategies in general, and WDM in particular.

## V. REGIONAL STUDIES CARRIED OUT AT THE MEDITERRANEAN LEVEL

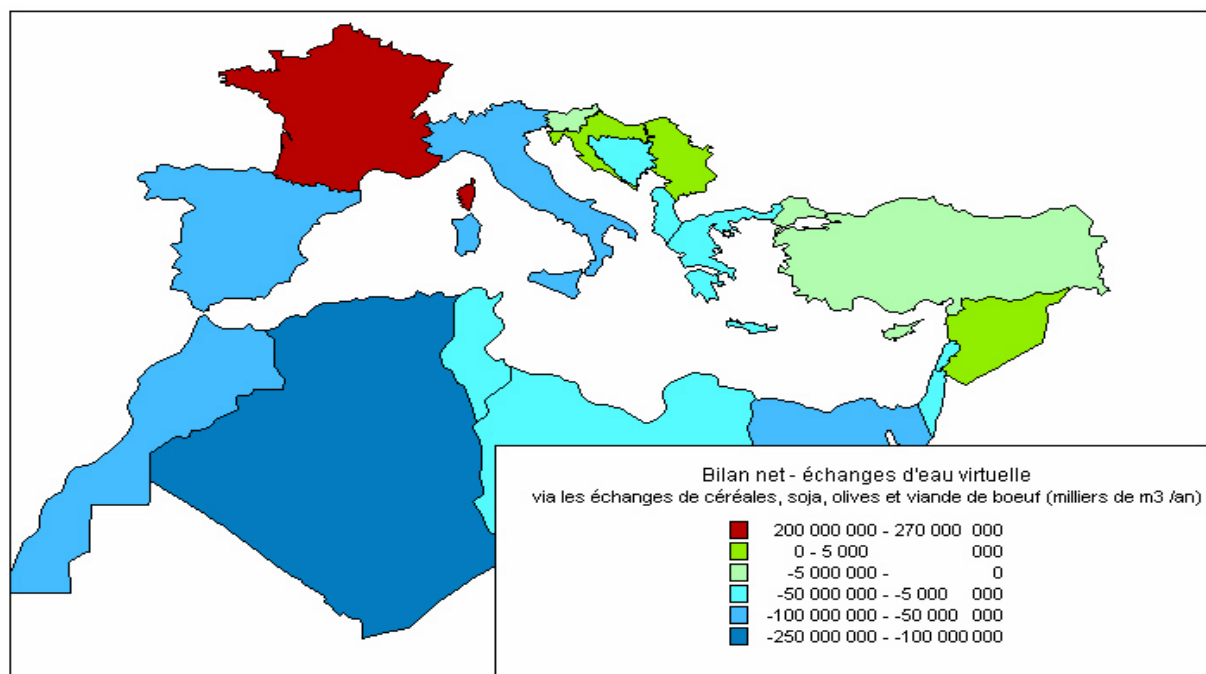
Three regional studies were conducted and presented at the workshop.

### 1. VIRTUAL WATER IN THE MEDITERRANEAN: A CONTRIBUTING INDICATOR IN THE ANALYSIS OF WATER MANAGEMENT ISSUES?

The main objective of this study was to present the concept of “virtual water” (water quantity necessary to produce a given goods), to quantify virtual water flow for the Mediterranean countries (via the imports and exports of agricultural products), and, then, to analyse the relevance of the virtual water concept to the orientation of agricultural policies and water policies (notably those related to WDM) in the Mediterranean context.

The results of the quantification of virtual water flows<sup>5</sup> (figure 1) highlight a North/South dichotomy in the Mediterranean region which may, in part, be explained by the disparity of available water resources, “green” waters (i.e. rainwater), in particular. The work has highlighted, however, the existence of a certain number of exceptions (Tunisia, Spain, Italy)<sup>6</sup>. Most of the Mediterranean countries are net importers of virtual water, except for France, Syria, Croatia and Serbia.

Figure 1 Net balance of virtual water exchanges in the Mediterranean



<sup>5</sup> The quantification focused on flows of virtual water associated with agricultural products accounting for 90% of the Mediterranean countries' exchanges of virtual water (beef, olives, soya and cereals). The contributions of blue water (irrigation water) and of green water (rainwater and soil water) have been calculated separately.

<sup>6</sup> Tunisia exports more virtual water via trade in cereals and soya than its neighbouring countries, which brings its profile closer to those of the Northern Mediterranean countries. Conversely, in Spain and Italy, virtual water imports related to cereals, soya and meat are high.

Virtual water flows in the Mediterranean via exchanges of cereals are quantitatively significant, in particular when compared with the volumes of virtual water consumed for the national production of the countries studied, or with their water resources available. For the importing countries, these flows may involve "water saving" if they induce reallocations - whether productive or not - of the non mobilized resources. The transfers of virtual water also entail consequences for the exporting countries because their increased mobilization may generate tensions between the users and environmental degradation.

The transfers of virtual water are generally made in a disguised, and often non conscious, manner insofar as they result from choices based on other issues (food safety, trade balance). The concept of virtual water thus proves to be an interesting tool for analysis inasmuch as it highlights the prevailing phenomena by giving orders of magnitude and calling for consideration, while its prescriptive value still remains to be proven.

The discussions underscored the need to extend the analysis to the whole range of the goods exchanged (other than agricultural products), while taking into account their trade value. An economic analysis, complementary to the agronomic analysis, should make it possible to address the objectives of the agricultural policies in terms of trade balance and food security, so as to then study their impacts on the management and distribution of water in the countries considered. It is indeed advisable to refocus the debate on the countries' food security strategies (strategies aimed at food self-sufficiency or relying on the international market), while taking into consideration the social dimension of agriculture. The harnessing of the concept of virtual water thus relates to the reforms of a macro-economic nature, to the debate on the distribution between rainfed crops and irrigated farming, as well as to issues pertaining in the integration of agriculture in the markets.

## 2. THE IMPACTS OF THE COMMON AGRICULTURAL POLICY REFORM ON WATER DEMAND FOR IRRIGATION

This study, based on the existing literature in 4 Mediterranean Members States (Spain, France, Italy, Greece), aimed at identifying the possible effects of the 2003 CAP Reform (known as Mid-Term Review, MTR) in terms of reallocation of cultivated land area (e.g. cultivated *versus* non cultivated, irrigated *versus* non irrigated land, etc), total water demand, water demand per hectare and farmers' income.

The main conclusions highlighted were as follows:

- Concerning the evolution of cultivated land area:

The effective degree of decoupling is a key element in determining impacts of MTR: partial decoupling has a weaker effect and causes a more limited reduction than full decoupling on irrigated surface in the short as well as and in the mid and the long term.

In general, crops with a substantial comparative advantage in the production-based coupled payments (such as maize, cotton and durum wheat) will be reduced.

A regional polarisation is likely to occur between regions already specialized in cereals, oilseed and protein (COP) cultivations - that are likely to specialize and grow further - and regions which are likely to regress, especially in the inland and mountain areas.

- Concerning the environmental impacts:

Even though one of the main goals of the 2003 CAP reform is to promote more extensive farming in Europe and encourage environmental protection, the results obtained show no

such an improvement in the new CAP decoupled scenarios unless additional measures to protect the environment are introduced (cross-compliance and good agricultural and environmental conditions).

- Concerning the evolution of irrigated land area and water demand:

More marked effects in terms of reduction of water demand are expected from the forthcoming reform of the fruit & vegetables and wine Common Market Organizations which will likely change the “opportunity” cost of irrigation for these crops. This change could cause the substitution between these crops and non irrigated arable crops.

Water demand management is not a major concern of the CAP and, accordingly, CAP impacts on water quality and - even more - water quantity issues are limited.

During the discussions, the participants raised the issue of the sensitivity of the results with respect to the evolution of market prices, upon which the evolution of irrigated areas and water demand strongly depend<sup>7</sup>. The reform of the CAP should lead to better consideration of market conditions in farmers’ decision-making processes (in regard, particularly, to irrigation practices).

### **3. INTERNATIONAL COOPERATION AND DEVELOPMENT FOR WATER IN THE MEDITERRANEAN: HOW IS WATER DEMAND MANAGEMENT TAKEN INTO ACCOUNT?**

The objective of this study was to provide a detailed quantitative analysis of the ODA (Official Development Assistance) to the Mediterranean countries in the water sector, to analyse the strategies and policies of intervention by the main donors acting in the Mediterranean (particularly with respect to WDM), as well as to highlight the obstacles met and the leverages possible for the promoting of WDM projects.

Mainly based on collection and analysis of data on public development aid in the OECD data base for 1973-2004, the analysis showed that the cooperation for water was greatly concentrated on a few large projects related to water supply and sanitation infrastructures, as well as on a limited number of countries<sup>8</sup>.

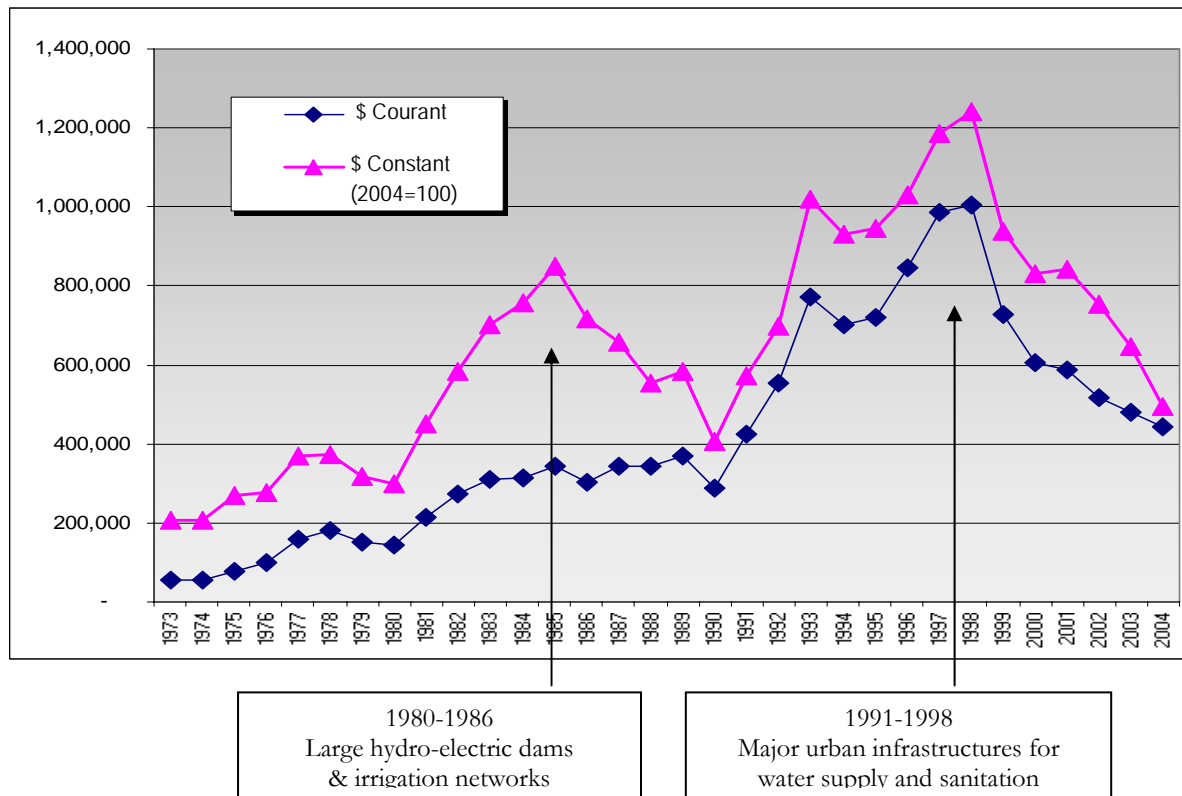
An analysis of the overall development of funding commitments demonstrates that the latter reached a high between 1980 and 1986 during the construction of the large hydro-electric dams and irrigation networks and again between 1991 and 1998 during the expanding of the large town facilities for water supply and sewer networks (figure 2). Since 1998, aid to the water sector in the region is declining (with, nevertheless, a resumption of commitments as from 2002).

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<sup>7</sup> A significant increase in the price of corn on the international market may, for instance, mitigate - if not reverse - the forecast decreasing trend of corn crop zones.

<sup>8</sup> 5 countries (Egypt, Morocco, the Palestinian Territories, Tunisia and Turkey) received 87,7% of the total aid granted to the sector over the period 1973-2004.

Figure 2 Evolution of the ODA to water sector 1973-2004 (three years moving average)



The projects in favour of the WDM, very often related to fine and diffuse actions, are very difficult to identify and quantify (because, in particular, of the very summary description of the projects in the OECD file). A more qualitative analysis of the strategies and recent policies of intervention by the major bilateral and multilateral donors serving in the Mediterranean (USA, Germany, Japan, France, European Commission, European Investment Bank, World Bank) has revealed that the strategies of these donors increasingly focused on an integrated management of water resources with, sometimes, incentives related to WDM<sup>9</sup>, but that the main part of the financing was still focused on drinking water supply, sanitation and wastewater treatment with a view to meeting the Millennium Development Goals (MDGs).

During the discussions, the donors underscored the fact that they intervene in support of steps and projects belonging in a comprehensive water management strategy defined by the beneficiary country itself according to the national context. Accordingly, it is, above all, up to the countries to list WDM as a national priority so that the donors could support WDM strategies and approaches. The need to develop decentralised co-operation in matter of WDM (allowing the dissemination of best practices on local level) was also put forward.

<sup>9</sup> For instance: incentives towards efficient use of the resources, introduction of water-saving farming practices, water pricing reforms, control over leaks and wastages in local community, etc.

# VI. CONCLUSIONS AND RECOMMENDATIONS OF THE WORKSHOP

## 1. MAIN CONCLUSIONS

In sum, the workshop has, first of all, highlighted the actual progress made since the Fiuggi forum as regards mainstreaming WDM in the water policies, as well as in certain sectoral policies.

At the regional level, the countries on the Mediterranean, thus, obtained a common strategy of sustainable development, the Mediterranean Strategy for sustainable Development, retaining water like priority field of intervention and attempting to promote the WDM.

At the national level, many countries had recourse to the various regulations, tax, contractual tools at their disposal to progress in the field of the WDM. Only the market instruments were not yet truly used.

In the local plan, the concern of better implying the water actors, in particular the users - that those concern the agricultural world or the urban area - was often reaffirmed and at the same time innovative and positive experiments were committed.

The exchanges confirmed these evolutions, but also shown the need for permanently having information reliable, comparable and regularly updated to inform and light the decision makers. They, also, underlined the interest to better articulate the problems related to the water resources management to the total environmental problems, and in particular the climate change.

Secondly, it has reaffirmed the importance which it is advisable to attach as regards WDM for agricultural and industrial sectors, with the drinking water supply and the safeguarding of the ecosystems. The association of the users of the domestic networks and the irrigated areas with the decisions with regard to them spring like an essential element of success of the initiatives in favour of the WDM. It is to say the importance which sticks to the public awareness, of education as regards WDM by stressing that this concerns the responsibility for the public and non-public actors. But this association - even responsabilisation - non-public actors calls an effort renewed as regards research, sharing good practices so that the technical routes most powerful permanently required then are adopted.

Thirdly, it has shown, as is demonstrated by the concept of "virtual water", that new approaches could be taken into account to clarify the choices. But the workshop also underlined the eminent part which the national authorities in the strategies and fields of intervention of the partners to the development. Indeed, as long as the States will not post a strong priority for the WDM, the partners with the development will be able to support the projects or operations with difficulty relating to it.

Finally, the participants proposed and adopted the following recommendations intended to the political decision makers so much their role as regards promotion of the WDM remains essential. They attempt to deliver short, clear and suitable messages for evaluation during next years.

## 2. RECOMMENDATIONS

Considering Recommendation 26 of the Action Plan adopted at the Johannesburg World Summit on Sustainable Development,

Committed to the implementation of the Barcelona Convention and the objectives of the Mediterranean Strategy for Sustainable Development,

Being of the opinion that the European Union Framework Directive on Water contains know-how in several fields which the EU neighbours might wish to share,

Considering that Water Demand Management is a resource and that it is an integral part of integrated water resources management,

Recalling that water demand in the Mediterranean is expected to increase by 50 km<sup>3</sup>/year by 2025 to reach 332 km<sup>3</sup>/year, and that the various losses due to transport, leaking and the various uses could exceed 120 km<sup>3</sup>/year,

The participants to the 3<sup>rd</sup> Regional Workshop on Water and Sustainable Development in the Mediterranean, convened at Zaragoza, 19-21 March 2007, recommend to the national political authorities of the Mediterranean countries to:

- include, in accordance with the MSSD orientations, Water Demand Management in the national priority strategies, to promote its implementation, on the one hand by setting annually on the basis of regional objectives, national objectives of efficiency and on the other – in order to achieve them – by mobilizing, with a concern for social equity, the various technical instruments and tools, but also those regulatory, normative, tariff, fiscal, contractual or market tools and instruments available to them; further, to coordinate its implementation, follow-up and evaluation in the various sectoral policies, especially in the fields of agriculture, energy, tourism, environment and land development,
- see to it that the problems connected with Water Demand Management are properly integrated within the global environmental problems, such as climate change, and biodiversity and ecosystem conservation,
- promote mobilization and responsabilization, at the various relevant territorial scales, connected with either the rural or the urban environment, of the various stakeholders concerned with Water Demand Management, public, academic, private or association-related by taking into consideration the particular role of women in this field; further to invite the partners, public – especially donors – and private to contribute to the resulting activities, operations and investments,
- take all necessary measures to raise the awareness of the public in terms of Water Demand Management – especially through environmental education activities, mainly by informing the public on the challenges involved and by identifying, implementing and making use of the relevant good practices, especially concerning the maintenance of water distribution systems, individual consumption of drinking water, rational use in agriculture as a function of the geographical context, and the protection of ecosystems,
- assess, every two years, progress accomplished in Water Demand Management and therefore reinforce the inclusion of Water Demand Management in the national information systems on

water; further to document the various relevant indicators, mainly those adopted by the MSSD,

- reinforce the regional scientific and institutional cooperation to promote Water Demand Management and contribute to setting up a Mediterranean Water Observatory which would, on a continuous basis, compile data, information and good practices useful to Mediterranean stakeholders and decision makers.

Moreover, it is expected of the Blue Plan, in conjunction with its partners to:

- make a report, every two years, on progress accomplished in the Mediterranean in the field of Water Demand Management
- contribute to establishing a compendium of good practices in the field of Water Demand Management
- organize in 2012 the fourth regional workshop on Water Demand Management.

(Done at Zaragoza, on 21 March 2007)



## VII. APPENDICES

- Appendix 1: List of participants
- Appendix 2: Workshop programme
- Appendix 3: Definition of water demand management
- Appendix 4: List of the MSSD water chapter's indicators
- Appendix 5: Indicators fact sheets (4 priority indicators)
- Appendix 6: Summary table of papers



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## APPENDIX 2: WORKSHOP PROGRAMME

# 3<sup>rd</sup>

## regional workshop on water and sustainable development in the Mediterranean

organised under the aegis of the Mediterranean Commission on Sustainable Development

# Water demand management, progress and policies

Mediterranean Agronomic Institute of Zaragoza (CIHEAM-IAMZ)  
Expo Zaragoza 2008

Zaragoza,  
Spain  
19, 20 & 21  
March 2007



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# 19

MONDAY  
MARCH 2007  
(IAMZ)

**08h30-09h00** Reception and registration of participants at the Mediterranean Agronomic Institute of Zaragoza

### Session 1

Opening speeches

**09h00-09h10** Mr Luis Esteruelas, Director of the Mediterranean Agronomic Institute of Zaragoza

**09h10-09h20** Mr Roque Gistau, President of Expo Zaragoza 2008

### Session 2

Introductory conferences on water demand management in the Mediterranean

**Chairman:** Mr Bertrand Hervieu, Secretary General of the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM)

**09h20-09h30** From Fiuggi to Saragossa: Presentation of the workshop (lessons learnt from the workshop held in Fiuggi in 2002, Mediterranean Strategy for Sustainable Development, workshop's objectives), Mr Henri-Luc Thibault, Director of Plan Bleu

**09h30-09h45** Facing water stress and shortage in the Mediterranean: Presentation of the Blue Plan's Environment and Development Outlook «water» chapter, Mr Mohammed Blinda, Programme Officer, Plan Bleu

**09h45-10h15** The main water users' point of view: Factoring water demand into:

- agriculture, Mr Adel Tlili, producer and exporter of agricultural products, former President of the Vegetables Committee Board (Tunisia)
- local authorities, Mr Francis José Maria, Director of the Department responsible for water supply in the Corniche des Maures area (SIDECEM, France)
- drinking water management, Ms Fatiha Belamari, Head of Planning Department at the National Office for Drinking Water (ONEP, Morocco)
- tourism, Mr Alessio Satta, Head of Sustainable Tourism Department at Ambiente Italia (Italy)

**10h15-11h00** Discussion

**11h00-11h30** *Coffee break*

### Session 3

Monitoring progress and promotion of water demand management policies in the Mediterranean countries

**Chairman:** Mr Henri-Luc Thibault, Director of Plan Bleu

**11h30-12h00** Presentation of national reports:

- Morocco, Mr Mohamed Oubalkace, Programme Officer, Ministry of Land Planning, Water and Environment
- Tunisia, Mr Abdelkader Hamdane, Director General of Rural Engineering and Water Exploitation, Ministry of Agriculture and Water Resources
- Egypt, Mr Atef Hamdy, Research Director, CIHEAM-IAM Bari

**12h00-12h30** Debate on progress made, difficulties encountered and advisable changes

**12h30-14h00** **Lunch**

**14h00-14h30** Presentation of national reports:

- Syria, Ms Reem Abed Rabboh, Director of Water Safety, Ministry of Local Administration and Environment
- Turkey, Ms Selmin Burak, Engineer, University of Istanbul
- Bosnia Herzegovina, Mr Igor Palandzic, Bosnia Herzegovina Water Works

**14h30- 15h00** Debate on progress made, difficulties encountered and advisable changes

**15h00-15h30** Presentation of national reports:

- Spain, Representative of the Mediterranean Network of Basin Organizations (to be confirmed)
- France, Mr Alain Pialat, Director of the Rhône Méditerranée Corse Water Agency
- Italy, Mr Giancarlo Boeri (Director) and Ms Giuseppina Farrace, Agency for the Protection of the Environment and Technical Services (APAT)

**15h30- 16h00** Debate on progress made, difficulties encountered and advisable changes

**16h00-16h30** **Coffee break**

**16h30-16h50** Presentation of national reports:

- Cyprus, Mr Iacovos Iacovides, Hydrologist, IACO Environmental & Water Consultants
- Malta, Mr John Mangion, Director, Directorate for Water Resources Regulation

**16h50-17h10** Debate on progress made, difficulties encountered and desirable changes

**17h10-17h20** Water demands and possible water savings in the Mediterranean countries, Mr Jean Margat, Vice-President of Plan Bleu

**17h20-17h40** Discussion

**17h30-18h00** Synthesis and conclusions by the Chairman

**20h00-22h00** **Social dinner (Restaurant « La Bastilla », Hotel Paris , Zaragoza city centre)**

**20** TUESDAY  
MARCH 2007  
(IAMZ)

**08h30-09h00** Reception of participants at the Mediterranean Agro-economic Institute of Zaragoza

### Sessions 4 & 5

Thematic working groups

#### Factoring WDM into the agriculture sector

**Coordination** CIHEAM

**Chairmen** Mr Nicola Lamaddalena

#### Factoring WDM into drinking and industrial water management

**Coordination** IME (Mediterranean Water Institute)

**Chairmen** Mr Mohammed Ben Blidia

#### Factoring natural water needs for ecosystems into policies

**Coordination** MedWet

**Chairmen** Mr George Zalidis

#### Factoring WDM into water policies

**Coordination** French Ministry of Ecology and Sustainable Development

**Chairmen** Mr Pascal Berteaud

### Session 4

Papers presentation on each issue

**09h00-10h00** Papers presentation

**10h00-11h00** Discussion

**11h00-11h30** **Coffee break**

### Session 5

Working tracks, proposals and recommendations

**11h30-12h30** Drafting of the working groups' conclusions and recommendations

**12h30-14h00** **Lunch**

### Session 6

Virtual water in the Mediterranean: An indicator to contribute to analysing issues on water management and distribution?

**Chairman:** Mr Mohammed Ait Kadi, President of the General Council for Agriculture Development in Morocco

**14h00-14h15** Presentation of the regional study's results, Ms Sara Fernandez (ENGREF, France)

**14h15-14h45** Discussion: Is « virtual water » a relevant concept to guide agricultural and water policies ?

**Session 7** The impacts of the Common Agricultural Policy on water demand for irrigation in the Mediterranean

**Chairman:** Mr José Ramón López Pardo, Director of International Relations, TRAGSA, Spain

**14h45-15h00** Presentation of the regional study's results, Ms Alessandra Scardigno (CIHEAM-IAM Bari, Italy)

**15h00-15h30** Discussion

**Session 8** International cooperation and development aid in the «water field» in the Mediterranean: How is water demand management considered?

**Chairman:** Mr Michael Scoullos, President of the Global Water Partnership Mediterranean (GWP Med)

**15h30-15h45** Presentation of the main results of the regional study carried out by Mr Georges Corm (consultant, Lebanon), Ms Gaëlle Thivet, Programme Officer, Plan Bleu

**09h40-10h00** Synthesis and proposals for general recommendations, Mr Henri-Luc Thibault, Director of Plan Bleu

**10h00-10h40** Discussion

**10h40-11h00** Adoption of the general recommendations and conclusions by the Chairman

**Session 10** Closing speeches

**11h00-11h10** Water demand management in the Mediterranean: From prospective analyses to policy making, Mr Pascal Berteaud, Water Director at the Ministry of Ecology and Sustainable Development (France) and President of the Euro-Mediterranean Information System on the know-how in the Water Sector (EMWIS)

**11h10- 11h30** Representatives from the Spanish Administrations

**11h30-12h30** Press conference

**12h30-14h00** Lunch

**Afternoon** Field trip

**14h00-15h30** Visit of the Expo Zaragoza site

**15h30-18h00** Visit of Zaragoza City centre

**15h45-16h15** Discussion with donors

**16h15-16h45** *Coffee break*

**16h45-18h00** Chairmen and rapporteurs of the thematic working groups: Synthesis of the working groups' conclusions and recommendations

**18h00-20h30** **Side event: Public session of the Water Tribune, Expo Zaragoza 2008 Permanent Forum on Water and Sustainability: «Water and demand management in the Mediterranean» (Centre «Ibercaja» in Zaragoza)**

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**WEDNESDAY  
MARCH 2007  
(CENTRE JOAQUIN RONCAL)**

**08h30-09h00** Reception of participants at the Centre Joaquín Roncal (Zaragoza city centre)

**Session 9** Main conclusions and recommendations

**Chairman:** Mr Mohammed Ennabli, President of the Mediterranean Water Institute and Vice-President of Plan Bleu

**09h00-09h40** Presentation of the debates' conclusions on the various themes, rapporteurs of the thematic working groups

## Papers presentation (session 4)

### Factoring WDM into the agriculture sector:

- ▶ An initiative towards water saving and sustainable demand irrigation management in the Mediterranean, Mr Atef Hamdy (CIHEAM-IAM Bari, Italy)
- ▶ Pricing the irrigation water in the Jordan Valley as a means of water saving in Palestine, Mr Mohammed Yousef Sbeih (ANERA, Palestine)
- ▶ Irrigation water demand management and institutional change, the experience of Tunisia, Mr Mohamed Ali Bchir (ENSAM, France)
- ▶ Joint management of the facilities in an irrigation district in North Tunisia, Mr Majid Mathlouthi (National Agronomic Institute, Tunisia)
- ▶ Advanced modelling tools for integrated assessment of water and agricultural policies, Ms María Blanco Fonseca (Polytechnic University of Madrid, Spain)
- ▶ Ador: A software for water management in irrigation districts, Mr Enrique Playán (CSIC-Aula Dei Experimental Station, Zaragoza, Spain)

### Factoring WDM into drinking and industrial water management:

- ▶ ISO/TC 224 standards on «Service activities relating to drinking water supply systems and wastewater systems. Quality criteria of the service and performance indicators» Mr Jean-Luc Redaud (CG AAER, France)

- ▶ Meeting users' expectations in drinking water services. The ISO 24510 standard, Mr Enrique Cabrera Rochera (Polytechnic University of Valencia, Spain)
- ▶ The Moroccan model for drinking water management. The National Initiative for Human Development (NIHD) in the progressive construction of a water market, Mr Claude de Miras (IRD, France and Morocco)
- ▶ Monitoring of consumption by Internet, Experience of the Marseille

## Water Company, Mr Sébastien Rabbia (Société des Eaux de Marseille, France)

- ▶ Recycling of grey water in Cyprus, Mr Stravos Kambellas (Hydranos Ltd, Cyprus)
- ▶ Water demand management tool, progressive rates: the case for drinking water in Tunisia, Mr Adelaziz Limam (SONEDE, Tunisia)
- ▶ How to reduce water consumption in the tourist sector in Tunisia? Approach and strategy, Ms Raoudha Lahache-Gafrej (ISSBAT, Tunisia)

## Factoring natural water needs for ecosystems into policies:

- ▶ Fifteen years of action to the service of the Drôme River, its affluents and of High-Roubion, Ms Magalie Vieux-Melchior (Communauté de communes du Val de Drôme, France)
- ▶ Assessment of ecosystem water needs for water resources management at catchment level: The case of Cheimaditida Lake, Mr Dimitris K. Papadimos (Greek biotope, Wetland Centre, Greece)

- ▶ Joint management for the sustainable preservation of the aquatic environment in the Mediterranean, Ms Sylvie Piquenot (Agence de l'eau Rhône Méditerranée Corse, France)
- ▶ Definition of a method to characterise the Mediterranean watercourses and its application in the framework of the WFD, Mr Olivier Arnaud (Maison régionale de l'eau, PACA, France)
- ▶ Taking into account the ecological needs of Ichkeul in water management in Tunisia, Mr Saeid (ANPE, Tunisia)

## Factoring WDM into water policies :

- ▶ Water saving and managing consumption as an alternative to conventional water resources. The experience of Gironde, Mr Bruno Jeudi de Grissac (SMEGREG, France)
- ▶ Water demand management of the West Bank, Mr Loay J. Froukh (Water Resources Planning and Management, Jordan)
- ▶ Experiences from the Eastern Adriatic on water utilities functioning, Mr Igor Palandzic (Bosnia Herzegovina Water Works, Bosnia & Herzegovina)
- ▶ What instruments are to be used to manage the dispersed withdrawals ? Examination based on the new water law and surveys carried out in Roussillon, Ms Marielle Montginoul (CEMAGREF, France)
- ▶ Why is it critical to mainstream gender in integrated water resources management in the Mediterranean? Mr Atef Hamdy (CIHEAM-IAM Bari, Italy)

## Map

- 1 Centro de congresos y Exposiciones Ibercaja
- 2 Centro CAI Joaquín Roncal
- 3 Hotel Tibur
- 4 Hotel Goya
- 5 Hotel Via Romana



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MEDA Water





## APPENDIX 3: DEFINITION OF WATER DEMAND MANAGEMENT

The « **water demand** » in terms of quantity is considered here as all the volumes of water mobilised (not including « green » water and « virtual » water) to meet the various uses, including the volumes « lost » in transport and usual practices. The demand is, therefore, the addition of the water withdrawals, the imported water and unconventional production (desalination, reuse, etc.).

**Water demand management** includes all the measures aimed at improving technical, social, economic, institutional and environmental efficiency in the various water uses. As a complement to the offer policies (dams, pumping, long distance transfers, desalination, etc.), water demand management is the main direction to help to reach two objectives at the heart of the concept of sustainable development: the **evolution in non viable consumer and production methods** on one hand, and the **protection and sustainable management of natural resources with a view to economic and social development** on the other hand.

Water demand management aims at:

- Reducing losses and bad use of water ;
- Optimising water uses by ensuring well thought out allocation of the resource to the different uses, while taking into account the ecosystem requirements, the objectives of preservation of the renewal and the quality of the resources as well as the development of in situ water use (without withdrawal) (recreational activities, aquaculture and fishing, energy) ;
- Creating more sustainable development for each unit of the resource mobilised ;
- Permitting substantial financial savings and economy of facilities for the countries, towns and industries ;
- Anticipating and avoiding the expected crises with baseline scenarios of the “business as usual” type.
- Contributing to reducing the pressure on resources, notably by reducing and stopping unsustainable uses (over-use, using of non renewable resources, groundwater mining)

WDM has, therefore, the vocation to become an **essential component of integrated water management** and of the **urban, rural, agricultural and industrial policies**. This involves putting in place a range of aids (strategies, policies and plans, economic, institutional and regulatory aids, information and awareness-raising campaigns, integration in training courses, and so on).

The Johannesburg Summit on sustainable development called for the designing of « **water efficiency plans** » and for integrated water resource management. Efficiency plans can be designed and implemented at various levels: country, catchment area, water tables, towns, irrigation perimeters, and so on. A growing number of towns throughout the world are currently setting up such plans.

An important question for the future is the evolution of the **relative place of offer and demand policies**. Given the limits of resources, the cost of offer policies and the pool of possible economies (between 20 and 25 % could be recuperated by merely reducing losses and bad use of water), WDM has a vocation to take a central position in Mediterranean water policies. If recourse to seawater desalination can be justified in the regions where water is very limited, despite the fact that the quantities remain limited, there is a risk of undermining the situation by recourse to desalination rather than thought out commitment to water demand management which is of course complex to implement and producing irreversible degradation. The growing foreseeable consequences in terms of environmental impact and cost, especially for the coastline, would be significant.



## APPENDIX 4: LIST OF THE MSSD WATER CHAPTER'S INDICATORS

Code	Indicator
<b>Priority indicators</b>	
WAT_P01	Index of water efficiency (total and by sector)
WAT_P02	Water demand, and compared to the GDP (total and by sector)
WAT_P03	Exploitation index of renewable natural resources
WAT_P04	Share of the population with access to an improved water source (total, urban, rural)
WAT_P05	Share of the population with access to an improved sanitation system (total, urban, rural)
<b>Complementary indicators</b>	
WAT_C01	Regulation index of water resources
WAT_C02	Silting up rate of dam reserves
WAT_C03	Non-sustainable water production index
WAT_C04	Surface equipped with modern irrigation systems
WAT_C05	Human and economic impact of floods
WAT_C06	Wetland area
WAT_C07	Water requirements for the ecosystems
WAT_C08	General water quality index
WAT_C09	Emissions of organic water pollutants
WAT_C10	Share of collected and treated wastewater by the public sewerage system
WAT_C11	Share of industrial wastewater treated on site
WAT_C12	Water cost recovery rate (total and by sector)
WAT_C13	Rate of public investments and expenditure allocated to water and Water Demand Management (WDM)
WAT_C14	Public development assistance devoted to water and proportion of this aid dedicated to programs of WDM



## APPENDIX 5: INDICATORS FACT SHEETS (4 PRIORITY INDICATORS)

### Is water demand becoming more moderate?

Better water demand management, especially for agriculture, is one of the priority actions recommended in the framework of the Mediterranean Strategy for Sustainable Development.

This implies stabilising water demand (reducing in the north and controlled increase in the south and the east). But water demand and growth in GDP should also be decoupled, while increasing the value added per cubic metre of water used.

Better demand management could also bring about a decoupling of the rise in irrigated production and the rise in the use of water for irrigation.

**Overall, the evolution in water demand is alarming in the Mediterranean countries because this resource is often scarce.**

The evolution in demand over the last ten years is different from one country to the next. In Croatia there has been a 48% reduction and a reduction of 30% in Slovenia, while Albania has increased its demand by 21% and Algeria by 31%.

The share of water for agriculture remains high in all the countries, often higher than 50% and even 90% in Syria and Morocco.

In some countries such as Croatia where green water (rainwater evapo-transpired by vegetation) is used for agriculture, demand for irrigation purposes is low.

The volume of water used to produce 1000 dollars of agricultural value added goes from about 15 m<sup>3</sup> in Slovenia to more than 3000 m<sup>3</sup> in Syria and Egypt.

Drinking water demand per inhabitant varies greatly from one country to the next, from fewer than 30 m<sup>3</sup>/annum/inhabitant (80 litres/day) to about 150 m<sup>3</sup>/annum/inhabitant (410 litres/day).

**Definition**

Total water demand is defined as the sum of the volumes of water mobilised to meet the various uses, including the quantities lost in production, transport and use.

It corresponds to the sum of the water withdrawals, of unconventional production (desalination, reuse, and so on) and of imports less exports.

Water demand compared to GDP per sector of activity corresponds to the demand for water used divided by the value added in the same sector (agriculture, industry).

**Precautions / Notes**

For agriculture, the indicator could be even more polished by calculating the ratio of irrigation water demand to the value added of the irrigated production.

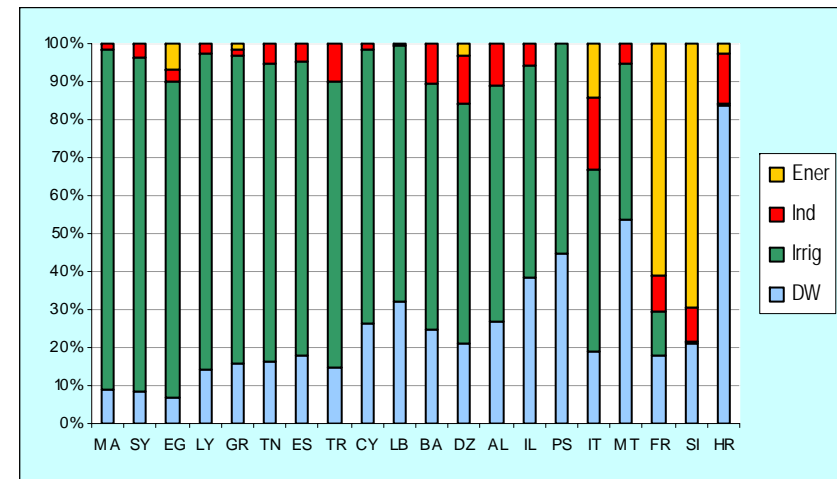
**Sources / References**

FAO-Aquastat, Eurostat, World Resources Institute, Plan Bleu and several national sources, including the reports presented at the regional workshop in Saragossa in 2007.

World Bank for the agricultural value added.

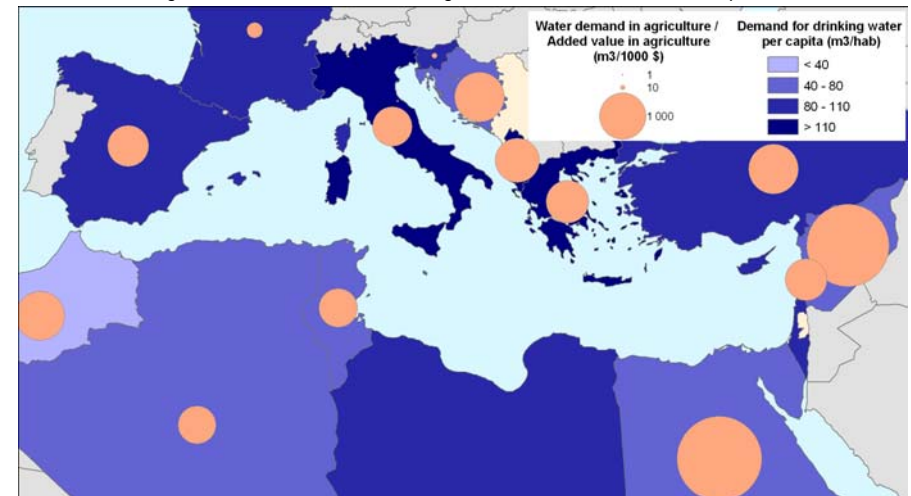
### 2. Water demand, total and by sector, compared to GDP

Water demand by sector (period 2000-2005)



Source: Several sources and Plan Bleu

Water demand in agriculture / Added value in agriculture and water demand per inhabitant in 2004



Source: Several national sources and Plan Bleu

## Is pressure on renewable natural water resources going down?

The preservation of water resources is one of the priority objectives of most of the Mediterranean countries.

***Pressure on water resources remains high, especially in the southern and eastern Mediterranean countries, but the situations are very different.***

The Mediterranean countries can be classified into three groups, according to the exploitation index:

- The first group of countries whose water withdrawals are close to or go beyond the average annual volume of renewable natural resources (index over 75%). These five countries (Egypt, Malta, Syria, Libya and Israel) are already experiencing great pressure on their natural resources and will have to meet a growing share of their demand with other “unconventional” resources.
- A second group of countries with an exploitation index of between 25 and 50% could experience local or temporary pressure. This is the case for six countries (Morocco, Tunisia, Algeria, Lebanon, Palestinian Territories and Cyprus).
- A third group of countries with an index under 25%, including Italy, Spain, Turkey, France and the Balkan countries.

The indexes approaching 100 could have several explanations: overexploitation of groundwater (Malta, Libya) or use of return water from agricultural drainage, thus allowing the gross withdrawals to exceed the primary renewable resources (Egypt).

The situation of the countries concerning available resources per inhabitant is slightly different:

- The countries experiencing water shortage, with annual resources of under 500 m<sup>3</sup> per inhabitant: Malta (82 m<sup>3</sup>/inhab), Libya, Palestinian Territories, Israel, Algeria and Tunisia (403 m<sup>3</sup>/inhab)
- The countries with little water, with annual resources of between 500 and 1000 m<sup>3</sup> per inhabitant: Morocco (694 m<sup>3</sup>/inhab), Egypt, Cyprus and Syria (980 m<sup>3</sup>/inhab).
- The other countries are « rich » in terms of water, with annual resources above 1000 m<sup>3</sup> per inhabitant.

These values, calculated at national level, could hide many disparities locally or in the river basins.

### Definition

This indicator measures the relative pressure of annual withdrawals on conventional renewable natural freshwater resources, including transport losses.

The resources of each country are defined by the surface or groundwater formed in or entering the country.

### Precautions / Notes

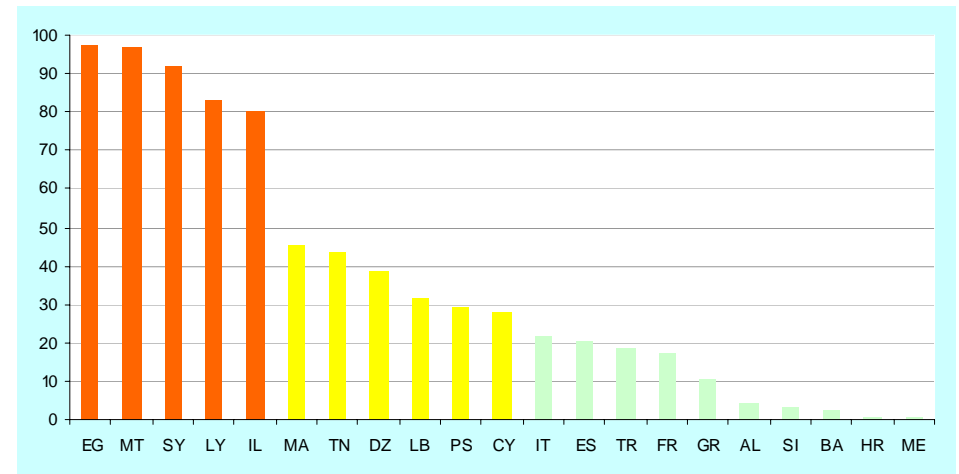
The annual available water is calculated over the medium to long term (30 years).

### Sources / References

FAO-Aquastat, Eurostat, World Resources Institute, Plan Bleu and several national sources, including the reports presented during the regional workshop in Saragossa in 2007

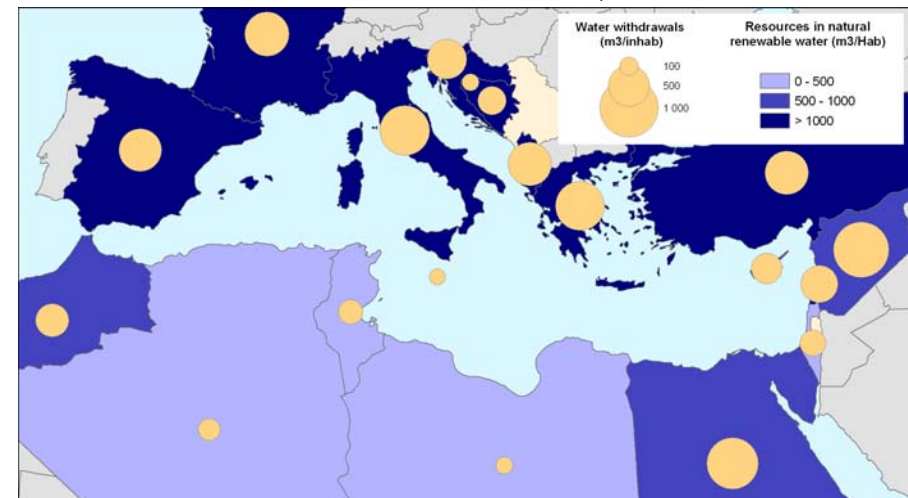
## 3. Exploitation Index of renewable natural resources

Exploitation Index of renewable natural resources (period 2000- 2005) in %



Source : miscellaneous and Plan Bleu

Renewable resources of natural water and water withdrawals per inhabitant (m<sup>3</sup>/inhab) in 2004



Source : miscellaneous and Plan Bleu

### Is access to drinking water increasing?

Sustainable access to drinking water is one of the Millennium Development goals. This implies reducing by half by 2015 (compared to 1990) the proportion of people without access to drinking water.

**The proportion of the population with sustainable access to a source of drinking water was over 80% in most of the Mediterranean countries in 2004.**

About 20 million people in the Mediterranean countries who generally live in rural areas did not have access to drinking water in 2004.

Many countries such as the EU countries, Croatia, Israel and Lebanon already have 100% access to drinking water.

Between 1990 and 2004, Morocco, Tunisia, Syria and Turkey made encouraging progress in this direction, while in Algeria the access rate went down.

In urban areas access is high, with more than 95% in most of the countries. It is under 95% in the Palestinian Territories and in Algeria.

The situation is not as good in rural areas. In 2004 four countries – Palestinian Territories, Syria, Tunisia and Algeria – had access rates of between 80 and 90%. In Morocco only 56% in 2004 but according to ONEP, this rate reached 77% in 2006.

Access to drinking water in the southern and eastern Mediterranean countries is around the world average of 83%.

This is also the case for access in urban areas. (95 %). The access rate in rural areas is higher than the world average (3 %)

**Definition**

This indicator represents the share of the population that is supplied with or that has reasonable access to sufficient drinking water. “Access” signifies here a source producing at least 20 litres per capita and per day and situated at fewer than 1000 metres away. (Millennium Indicator n°30).

**Precautions / Notes**

Because of the fact that there are different characteristics to distinguish urban areas from rural areas in the Mediterranean countries, the distinction between « urban population » and « rural population » cannot easily be given one sole definition applicable to all of the countries. The national definitions refer in general to the size of the built-up areas, the rural population thus being the rest of the population not considered as urban.

The problem of frequent water cut-offs in many Mediterranean countries is not taken into account in this indicator.

This indicator should be made more precise for the Mediterranean in order to show the progress made in direct access to water at home.

**Sources / References**

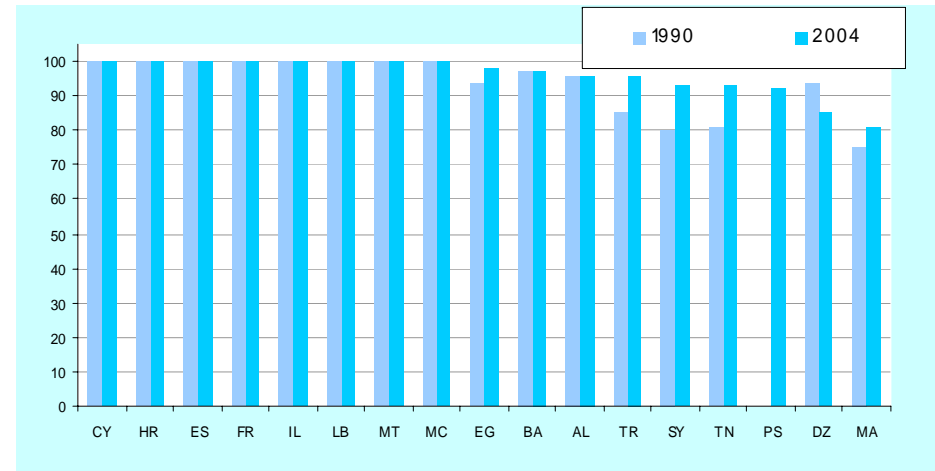
United Nations Statistical Division, The Millennium Indicators Database.

WHO/UNICEF Joint Monitoring Programme (JMP) for the water supply and sanitation.

Morocco: ONEP.

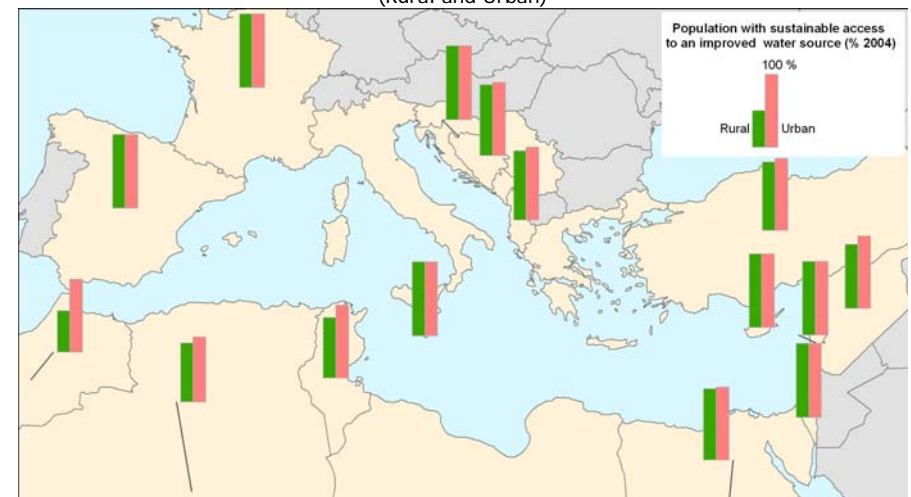
### 4. Share of population with access to an improved water source

Share of population with access to an improved water source



Source : UNSD

Share of population with access to an improved water source (Rural and Urban)



Source : UNSD

### Is access to waste water collection improving?

Access to an improved sanitation system (not necessarily including waste water treatment) is important, especially in urban areas where the risk of contact of the population with waste water is more frequent.

Access to sanitation is one of the Millennium Development Goals. It implies reducing by half by 2015 (compared to 1990), the proportion of people without access to a sanitation system.

***In the Mediterranean, about 47 million people do not have access to an adequate sanitation system.***

The proportion of the population with access to a sanitation system ranges from 72% in Libya to 100 % in most of the northern Mediterranean countries.

The percentage of the urban population with access to a sanitation system is about 100%, with the exception of Egypt (86%), Morocco (88%) and the Palestinian Territories (78 %).

The differences between urban and rural areas are still great (30 % in Syria) and the access rate in rural areas can be less than 70% (Morocco, Tunisia, Syria and Libya).

Access rates to a sanitation system in the Mediterranean are higher than the world average (global rate of 59 %, 80% in urban areas and 39% in rural ones).

**Definition**

This indicator represents the share of the population with access to a basic sanitation system for the evacuation of human excrement from homes or in the immediate neighbourhood (public waste water network, septic tanks and so on). (Millennium Indicator n°31)

**Précautions / Notes**

The fact that facilities are available is not necessarily proof that they are used. A town sanitation network should allow for the collection and evacuation of waste water of all types (cess-water, household water, industrial water, etc.) while ensuring transport of this waste as quickly as possible to the place where it is treated (waste water treatment plant).

Because of differences in the definition of the urban population from one country to the next, international comparisons can be biased.

This indicator should be made more precise in the Mediterranean region in order to show the progress made depending on the type of waste water collection (individual or collective) and the treatment methods.

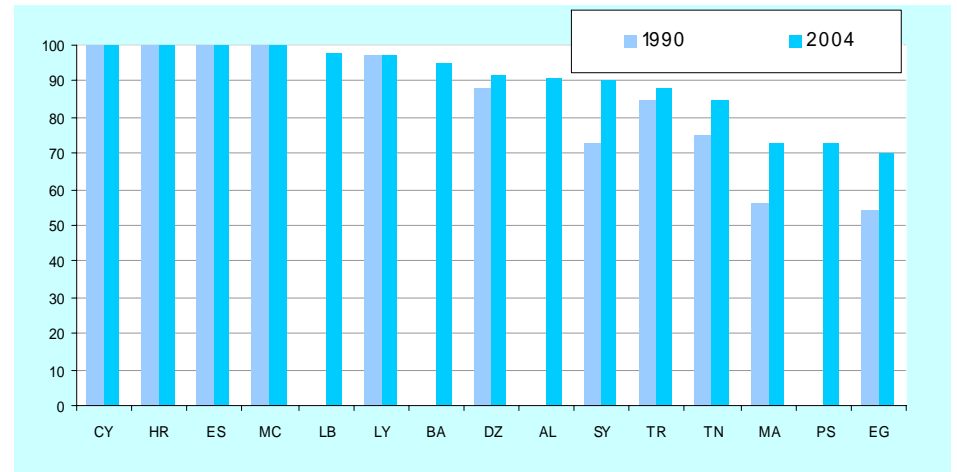
**Sources / References**

United Nations Statistical Division, The Millennium Indicators Database.

WHO/UNICEF Joint Monitoring Programme (JMP) for the water supply and sanitation

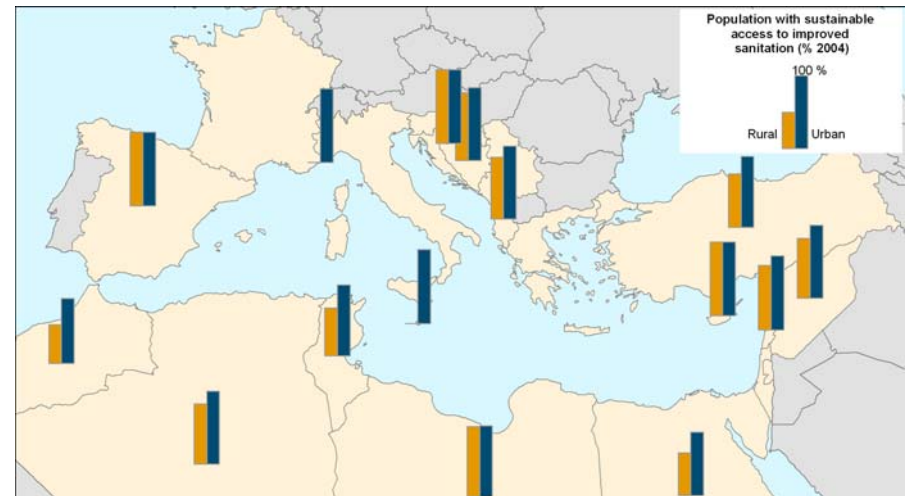
### 5. Share of population with access to an improved sanitation system

Share of population with access to an improved sanitation system



Source : UNSD

Share of population with access to an improved sanitation system (Rural and Urban)



Source : UNSD



## APPENDIX 6: SUMMARY TABLE OF PAPERS (1 AGRICULTURE, 2 DRINKING & INDUSTRIAL WATER, 3 ECOSYSTEMS, 4 WATER POLICIES)

Title of the paper	Authors
1- An initiative towards water saving and sustainable demand irrigation management in the Mediterranean	A. Hamdy (IAM Bari, Italy)
1- Pricing the irrigation water in the Jordan Valley as a mean of water saving in Palestine	M. Y. Sbeih (Palestine)
1- Irrigation water demand management and institutional change, the experience of Tunisia	M. Bchir, M. Bachta (Tunisia, France)
1- Joint management of the facilities in an irrigation district in North Tunisia	M. Mathlouthi, F. Lebdi (Tunisia)
1- Advanced modelling tools for integrated assessment of water and agricultural policies	M. Blanco Fonseca (Spain)
1- Ador : a software for water management in irrigation districts	E. Playan, J. Caverro, I. Mantero (Spain)
1- The role of supplementary irrigation for food production in a semi-arid country, Palestine	M. Y. Sbeih (Palestine)
1- Mixed crops systems and possibility of improving the on-farm use of irrigation water	M. Rezig, A. Sahli, F. Ben jeddi, Y. Harbaoui (Tunisia)
1- The problem of rainwater losses and harvesting in Southern Tunisia	A. Zammouri (Tunisia)
1- Impact of the Nile Basin Initiative on the Agricultural Policy of Egypt	T. Sileet, A. El Fattah Metawie, W. R. Soliman (Egypt)
2- ISO/TC 224 standards. Quality criteria of the service and performance indicators	J-L. Redaud (France)
2- Meeting users' expectations in drinking water services. The ISO 24510 standard	E. Cabrera Rochera (Spain)
2- The Moroccan model for drinking water management. The NIHD in the construction of a water market	C. de Miras (France and Morocco)
2- Internet-based consumption monitoring, Experience of the Marseille Water Company	S. Rabbia (France)
2- Recycling of grey water in Cyprus	S. Kambellas (Cyprus)
2- Water demand management tool, staggered rates: the case of drinking water in Tunisia	A. Limam (Tunisia)
2- How to reduce water consumption in the tourist sector in Tunisia? Approach and strategy	R. Lahache-Gafrej (Tunisia)
2- Towards sustainable water management in Algerian towns	M. Bessedik (Algeria)
3- Fifteen years of action in the service of the Drôme River, its affluents and of High-Roubion	M. Vieux-Melchior (France)
3- Assessment of ecosystem water needs for water resources management at catchment level: Cheimaditida Lake	D. K. Papadimos (Greece)
3- Joint management for the sustainable preservation of the aquatic environment in the Mediterranean	S. Piquenot (France)
3- Definition of a method to characterise the watercourses and its application in the framework of the WFD	M. Olivier Arnaud (France)
3- Taking into account the ecological needs of Ichkeul in water management in Tunisia	M. Saied, M.J. Elloumi (Tunisia)
4- Water saving and managing consumption. The experience of Gironde	B. Jeudi de Grissac (France)
4- Water demand management of the West Bank	L. J. Froukh (Jordan)
4- Experiences from Eastern Adriatic on water utilities functioning	I. Palandzic (Bosnia & Herzegovina)
4- What instruments need to be used to manage scattered abstractions? Examples in Roussillon	Marielle Montginoul (France)
4- Why is it critical to mainstream gender in integrated water resources management in the Mediterranean ?	R. Quagliariello, A. Hamdy (IAM Bari, Italy)
4- Challenges to manage droughts in Mediterranean countries	A. Iglesias, L. Garrote (Spain)
4- Linking knowledge with actions in the context of Para'a watershed management in the West Bank	B. Dudeen (Palestine)
4- Frame's theory of a new conceptual water integrated model for semi-arid Mediterranean countries	S. Jalala, J. Mania (France and Palestine)
4- Water demand management : the French experience	J. André (France)
4- Reorientation of the national water policy in Morocco, towards a supply-demand integrated management	M. H. El Badraoui, M. Oubalkace (Morocco)
4- Economic analyses for supporting policy decisions for sustainable water management	M. Sahili, F. Antonelli, P. Strosser (Morocco, France)