Euro-Mediterranean Ministerial Conference on Local Water Management

Turin, 18 - 19 October 1999

ACTION PLAN

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1. FOREWORD

The Euro-Mediterranean Partnership launched by the Barcelona Declaration of November 1995 embraces a vast programme of collaboration in a variety of spheres, economic and financial co-operation in particular, and indicates the priority actions for developing Euro-Mediterranean co-operation. Based on the principles of the Rome Charter, a specific chapter of the Declaration is dedicated to water and the guidelines for implementing these actions are outlined therein.

The experience gained from years of intense collaboration within the Euro-Mediterranean Partnership and from other projects and developments carried out in the Mediterranean region has emphasised the major importance of water in an environmental and economic context and in all aspects of the development process. Water is a vital resource and has significant social implications in particular in the Mediterranean.

The Stuttgart Conference of the 27 Euro-Mediterranean Ministers of Foreign Affairs (April 1999) reaffirmed the priority of water policy and indicated that the Euro-Mediterranean Ministerial Conference of Turin should lead to recommendations for further operational activities in the water sector.

In Malta (July 1999), the Directors General for Water agreed on the necessity to reinforce the strategy defined during the 1st Euro-Mediterranean Conference on Local Water Management in Marseilles November 1996 for improving water management in the Mediterranean, as a basis for an action plan for the Partnership. The Action Plan should include those mechanisms and tools necessary to make the programmes operational.

It is in this spirit, considering the numerous priorities identified during the preparatory work for improving water resources management, that this document is being presented at the Conference, with the aim of contributing to improving the sustainable availability of water resources for the economic and social development of our region. We intend to give water management stronger impetus within the framework of the Euro-Mediterranean Partnership, and guide partners and public and private institutions operating in this sector towards a strategy of coherent, ample and participatory implementation.

In this context, it is evident that a complete vision of the many on-going activities or activities planned by international organisations, bilateral co-operation and non-governmental organisations will be useful for rationalising projects, so as to maximise water resources efficiency.

A more significant role could be assigned to certain organisations, making the most of what has been accomplished so far. This is a need dictated by the possible dispersion of interventions and by the call for rationalisation.

To this end, the Action Plan should take full advantage of the potential of the Mediterranean Water Network, explicitly mentioned in the work programme attached to the Barcelona Declaration.

The implementation of a complex and ambitious action plan, commensurate with the important role that water plays for the balanced social and economic development of the Mediterranean region, requires appropriate financial backing. Consequently, greater weight for support should be given within the MEDA to the water sector and wider involvement of other organisations such as the EIB, in co-ordination with other financial institutions such as the World Bank, regional funding authorities and private investors, will be called for.

It will also be necessary to identify the most suitable type of organisation for promoting and co-ordinating the full implementation of the Action Plan within the foreseen calendar, in order to have a point of reference for the Partners and interested parties and to decide which initiatives to implement. This should be done making full use of what has already been achieved within the Euro-Mediterranean framework and by existing structures operating in the Mediterranean.

The present document is the outcome of a drafting process based on the work done by a drafting group that met in Cagliari on 13 and 14 September and on comments from various Partners following the Malta meeting.

1.1 Evolution of Euro-Mediterranean co-operation in the water sector

The first Mediterranean Water Conference organised on the initiative of the European Commission was held in May 1990 in Algiers. At this conference the Ministers responsible for water of the Mediterranean states adopted the Algiers Declaration to highlight the importance of a common strategy for water management. In particular they stressed the problem of assessing water resources, the importance of economising water, the need for strengthening the institutions, their regulatory framework and financial resources as well as the essential role of international co-operation between countries of the Mediterranean basin in water resources management problems.

The Algiers Conference was followed by the 2nd Mediterranean Water Conference, organised in October 1992 in Rome on the initiative of Italy and the European Commission. The outcome of this conference was the adoption of the Mediterranean Water Charter in which twelve Mediterranean countries undertook to implement measures concerning water planning and management, regional, international and Euro-Mediterranean co-operation.

In Rome it was also decided to set up the Mediterranean Water Network (MWN). Spain followed up this undertaking, formulating the organisational structure of the network at the Valencia Conference in 1993. The MWN, which comprises among its members also a few countries not belonging to the Euro-Med Partnership, held a Technical Conference in Valencia in 1998. The recommendations and the Action Plan for the next 2 years proposed by this Conference were adopted by the General Assembly of the MWN in Malta on 5th July 1999.

At the Barcelona Euro-Mediterranean Conference in November 1995, representatives of the non-Community Mediterranean countries and the European Union member states adopted the Barcelona Declaration and established the Euro-Mediterranean Partnership, which involves a vast and articulated working programme to be conducted in a variety of sectors. A specific chapter devoted to water takes up the principles of the Rome Charter and provides guidelines for its implementation.

In November 1996, on the initiative of France, the 1st Euro-Mediterranean Conference on Local Water Management was held in Marseilles and resulted in the adoption of the Marseilles Declaration by the Ministers responsible for water recommendations were put forward to the Ministers concerning the management of water for sustainable agriculture and for drinking water and industrial uses, basic and continuing training in the water sector, the strengthening of institutions in this sector. In addition, it was decided at Marseilles to create the first concrete co-operation tool for exchanging information on know-how in water management: Euro-Mediterranean Water management Information system (EMWIS).

The Short and Medium Term Priority Environmental Action Programme SMAP adopted at the Euro-Mediterranean Ministerial Conference on the Environment in Helsinki in November 1997 stated that integrated water management is one of the priority fields of action of the Programme.

The 3rd Euro-Mediterranean Foreign Ministerial Conference held in April 1999 in Stuttgart reaffirmed that water management remains one of the priority areas for Euro-Mediterranean co-operation. It also emphasised the importance of integrating environmental issues.

To maintain continuity with the above initiatives, with a view to supporting the Barcelona process and reinforcing, in terms of concrete actions, what has already been established within EMWIS on the issue of water management in the Mediterranean basin, Algeria and Italy have come forward as promoters of the 2nd Euro-Mediterranean Conference on Local Water Management, which will be held in Turin on October 18 and 19, 1999.

In the process following up the Turin Ministerial Conference, due consideration should be given to identifying and examining the challenges and problems which may arise in terms of changes in water demand and use due to the possible structural changes in production patterns and organisation of economic sectors such as agriculture, industry, tourism, etc., as the Euro-Mediterranean Free Trade Area develops and becomes a reality. Particular attention should be paid to the overall implications for water management and the need to ensure environmental sustainability in harmony with the socio-economic needs for water.

1.2 EMWIS as the first Euro-Med co-operation system on water information

Following the 1996 Marseilles Euro-Mediterranean Conference on Local Water Management a working group of 10 countries recognised the need for setting up an information processing system that using advanced means of communications enabled existing sources of information to be linked up via a network. This project was named EMWIS (Euro-Mediterranean Water management information system) and was approved by the 27 Directors General for Water during the Naples Conference held in December 1997.

The project created a new mechanism for linking the countries, consisting of national focal points and of a high-speed customised communications network connected to Internet. In this way, updated certified information on “who does what” is made available to policy makers and to different operators involved in water related issues, initially in four priority areas: documentation, training and research, institutions and data handling.

EMWIS is the first concrete Euro-Mediterranean Partnership instrument that enables its 27 partners to use a water resources information network and to exchange certified information through an agreed procedure by means of a communication network linked to Internet at high speed.

The EMWIS is organised as follows:

- ***A Steering Committee of 10 countries under the chairmanship of Italy with Jordan as co-chairman, will define the main strategies, approve the budgets and the annual and final reports of activities;***
- ***A network of national focal points;***
- ***A technical unit set up by three organisations operating in the field of water resources.***

EMWIS is today operational and could contribute within its mandate to broader co-operation on the water issues in the region.

1.3 Other relevant developments for integrated water management

Internationally the importance of integrated water management and the water basin approach has been recognised as the basis for sustainable water management. The UN Convention of non-navigational use of international waters from 1997 and the UN ECE Convention on transboundary watercourses and international lakes from 1992 are important international agreements laying down these principles. The signing in London in June 1999 of a protocol on water and health under the UN-ECE Convention, elaborated in co-operation with the World Health Organisation – Europe, marked an important step towards the implementation of these principles within the northern European region. This protocol requires the establishing of national action plans for provision of safe drinking water and sanitation of sewage and wastewater with a water basin approach.*

The Mediterranean Action Plan (MAP)/Blue Plan and its activities over the last twenty years present another important regional contribution on water management. The Blue Plan in particular is entrusted with the elaboration of a Mediterranean "Vision" on water in 2025, in the framework of MEDTAC. The Mediterranean Commission for Sustainable Development (MCSD) has also included water among its priorities and developed recommendations on the management of the water demand, which were adopted in Tunis (November 1997) by the Contracting Parties to the Barcelona Convention.

The European Union is currently restructuring its water policy along the lines of the UNECE Convention and the expected adoption of a proposed water framework directive in the near future implements the river basin approach within the European Union.

The World Water Council conference on a World Water Vision for 2025 planned for March 2000 and the activities of the Global Water Partnership and its regional technical advisory committees (TACs) in particular the Mediterranean TAC (MEDTAC) mark other important initiatives in the strive towards integrated water management .

Another opportunity to share experience and draw conclusions for further action will be the international water conference, hosted by Germany, in preparation for a review of Agenda 21, chapter 18 in 2002 (Rio+10).

* Turkey has made a reservation on the first paragraph (1.3)

2. THE CONCEPT OF THE ACTION PLAN

2.1 Policy and funding orientation

- The Euro-Mediterranean Principles for Water Management

The Marseilles Conference has defined a body of policy principles in order to guide Euro-Mediterranean collaboration for the improvement of local water resources management and established guidelines for co-operation in this sector. Specifically, economic and social development policies should take water management into proper account, considering the social and economic value of water and ensuring, within the framework of a global and integrated approach, that water is managed respecting its natural environment. Effective access to drinking water for the poorest people would have to be ensured. Water quality must be managed and quality standards for freshwater supply and for the disposal of waste water should be established.

Water needs to be managed in a participative manner, contributing to the enhancement of a sense of solidarity between different users. It should be recalled that water has always had an important place in Mediterranean culture. The value of water and other issues related to the sustainable management of water should be made known to people, by means of sufficient and accessible information.

In the region there is an increasing gap between potential water availability and foreseeable demand, which requires management policies for water uses and resources based on short, medium and long term development plans, which should take into account social, economic and environment criteria.

- Integrated water management plans and programmes

Water resources management should be based on integrated programmes containing all those measures required to implement the objectives of the water policy together with those measures required under other policies and relevant legislation. The idea is to achieve an overview of the measures needed to achieve all policy objectives in relation to a particular body of water (e.g. a river or a lake). This approach allows a degree of rationalisation and co-ordination of the different measures taken.

The integrated approach also helps to ensure protection of water as an economic resource by protecting and improving surface water and groundwater for environmental reasons and increasing the quality and protecting the quantity of water available.

The water policy must be flexible to avoid imposition of inappropriate or unnecessarily strict requirements simply for the sake of harmonisation. Such flexibility would also ensure that, where a problem is regionally specific, measures appropriate to that particular area could be taken. The range of environmental conditions in the Mediterranean basin is very wide and this must be taken into account.

Requirements for investment by individuals, private companies and/or public authorities must be targeted to the objectives of water policy and with a view to the cost-effectiveness of the measures. Long-term benefits and long-term environmental consequences of non-action must be fully taken into account, as must the precautionary principle.

A cost-effective strategy implies assessment from an economic perspective of advantages and disadvantages (emission reduction, quality improvement) of the three basic sets of policy instruments: regulations and standards, new technology and internalisation of external pollution costs through pricing and market-based incentives. These sets of policy instruments are not mutually exclusive and can be used as complementary or alternative measures depending on their relative cost-effectiveness to address water pollution as well as water scarcity issues.

Finally, water policy is not to be seen in isolation, but as a contributory element in the wider search for a balanced and sustainable development. And such a sustainable approach cannot be neither planned nor implemented in a satisfactory and efficient way without providing for broad consultation and **participatory procedures** of all actors concerned.

2.2 Structure of the Action Plan

A feature that clearly emerges, in spite of the proliferation of international activities in the region, is the shortage of specific programmes for the water sector, both as far as infrastructures and major environmental issues are concerned.

Furthermore the social, environmental and overall economic aspects need to be assessed at the national level, in order to maximise the availability of water resources with respect to the development objectives and make available the financial resources necessary for the large investments that are now indispensable.

It is important to build on existing organisations and co-operation schemes in the Mediterranean water sector because of their experience, rather than creating new ones. New organisations should only be created where a clear gap exists in competence or information requirements.

Water being among the six priority fields of co-operation retained within the Euro-Mediterranean Partnership, it was felt necessary to define the framework for action and the rules for funding in this context through a specific **Action Plan**. This Plan, building on existing experience and providing from the outset for complementarity and synergy with other relevant programmes and organisations active in the region, intends to go a step further and facilitate covering the gaps. Its implementation will be achieved through projects of a considerable scale to be submitted by the interested Partners for funding. The major financial instrument to this end will be MEDA with both its regional and national programmes. This Action Plan will form a reference document vis-à-vis other sponsors and investors as well.

This Action Plan promotes the following six priority areas of actions:

1) Integrated management of drinking water supply, sanitation and sewage services;
2) Local water resources and water demand management (quantity and quality) within catchment areas and islands;
3) Water scarcity management and combating drought;
4) Irrigation water management;
5) Use of non-conventional water resources;
6) Preparation of national and local scenarios for the period until 2025 that enable precise objectives to be set and actions to be taken for sustainable water management;

The actions will be implemented at the regional and sub-regional level and/or on islands, depending on the countries' needs, whilst ensuring exchange of useful and essential experiences, taking into account environmental and nature needs.

Within each area of action the following horizontal themes will be integrated with a view to their implementation in specific, targeted ways based on the particular conditions and needs at the regional, sub-regional and local level:

1) Strengthening institutional capacities and training;
2) Exchange of information and know-how;
3) Transfer of know-how and technology;
4) Awareness raising, mobilisation and promotion of commitment of the population.

Because of its importance, in particular in the Mediterranean socio-cultural context, awareness raising, mobilisation and promotion of commitment of the population is considered as major contribution to an efficient Action Plan for integrated local water management.

It is the basis to the needs of training and information and technology transfer. As well it forms the basic instrument for recognising such needs and helps setting them within the different contexts of the region.

The actions could be developed in two different directions:

- Testing and development of services that, once fully operational, could be continuously available, and
- Launching of actions/projects of given duration, focused on specific contexts and goals.

In the following chapters priority areas and horizontal themes are described in order to define actions, which should be promoted and could be eligible for funding.

2.3 The stakeholders

The actions may involve institutional bodies and social organisations operating in the regions considered, assigning them different roles, such as:

- *central and local institutions;*
- *management agencies;*
- *users;*
- *social forces (farmers', companies' and user associations);*
- *schools;*
- *research and training centres;*
- *non governmental organisations;*
- *media;*
- *banks, financial institutions and foundations*
- *private companies*

3. PRIORITY AREAS

Scenarios for future development e.g. in the areas of irrigation, drought management, desalination, urban needs and tourism could be prepared, in particular focusing on implications for capacity building and training, where such scenarios do not already exist.

Such scenarios could be developed in co-operation between the national institutions responsible for water resources management and appropriate organisations with experience in the selected areas.

For the above action as well as all other actions discussed below it is important to stress that these should be implemented within the framework of integrated water management at the river basin level. The river basin is the geographical area within which rainwater and other precipitation either infiltrates into the ground or flows through a system of rivers, tributaries and lakes, through estuaries, lagoons or other brackish waters towards the sea. A river basin includes its associated groundwater aquifers. Thus, action taken within a confined area of a river basin without consideration of the overall impact on the river basin may upset the ecology and equilibrium of resources up- and downstream of that area and sometimes even alter the hydro-morphologic and ecological features of the entire basin.

Within this management framework actions of a sub-regional or local nature should take account of the particular situation and conditions, identifying any natural constraints on water use due to ecological needs, the amount of available exploitable resources and needs for protection and/or improvement of the quality of the resource. Moreover, the particulars of use patterns, demands and socio-economic structures within the specific areas of application should also be taken into account.

This applies in particular to provision of water for irrigation, which presently consumes an average of approximately 65% of water in the region but also to wastewater treatment, and to any other sectoral use of water. Water use within these sectors cannot appropriately be dealt with on a sustainable basis without being placed within these overall water management and development perspectives.

3.1 Integrated management of drinking water supply, sanitation and sewage services

♦ ***Description***

Water is an environmental, social and economic asset and as such needs to be managed with the objective of conserving a common patrimony in the interests of the community at large. Thus it is necessary and important to guarantee water availability over time by means of sustainable forms of exploitation, that will allow nations to cope with present demands without jeopardising environmental balance and the needs of future generations.

Scarcity of water resources in some Mediterranean regions further emphasises the importance of this. The Blue Plan/MAP study “Water in the Mediterranean Region” showed that 28 million persons, 7% of the entire Mediterranean population, lie below the poverty line of 500 m^3/year per capita and 115 million persons, 29% of the populations are below the threshold of 1000 m^3/year per capita.

The predicted future population size in the Mediterranean area, due both to population growth and population shifts towards urban and coastal areas will further increase the pressure on water resources. For the next 30 years the Blue Plan forecasts a consistent reduction of per capita water resources, especially in the southern and eastern Mediterranean countries.

There is an urgent need for reducing consumption and for water conservation by means of efficient management of the entire cycle of water use: from optimal management of reservoirs or other sources of supply (wells, springs) over rehabilitation of water conveyance and distribution networks and sewage systems, to efficient management of treatment plants (for drinking water and wastewater treatment).

Reorganisation of water services based on an integrated approach should distinguish between the parties responsible for safeguarding the user and the parties in charge of management. It is also necessary to overcome the often fragmented organisation of water management and to redress the imbalance between the nature of the service and the rates and cost of the service through an appropriate regulatory body.

♦ ***Importance of the priority area and impact on the Mediterranean region***

The organisation of integrated water service management implies a rethinking of management strategies in the majority of Mediterranean regions. Reorganisation should ensure the necessary technical and economic efficiency as well as education and use of appropriate practices of personnel and human resources required for meeting the objective of satisfying user needs and improving living conditions, as well as ensuring respect for the environment and the aquatic ecosystem.

A major commitment, in terms of both human and financial resources, is required to ensure these changes, especially in those countries where water resources are scarce or dwindling.

♦ ***Suggested Actions***

To implement the integrated management of drinking water, sewage systems and wastewater treatment, several management and technological actions can be envisaged. Important inspiration for actions ensuring safe drinking water and sanitation of wastewater and the involvement of users and the general public may be found in the Protocol on Water and Health to the UNECE Convention on Transboundary Watercourses and International Lakes, which was signed in London in June 1999. Actions should prioritise demonstration projects, technical assistance and training on the following topics:

- ***For management action***
  - *Promotion of management schemes representing local administrations, responsible for the quality and efficiency of the service delivered;*
  - *Capacity building in view of ensuring relevant management bodies operating at regional level and of a size suitable for achieving efficient, effective and economic management.*

Priority will be given to the following aspects:

- *Promotion of alternative forms of management, including forms of private sector participation (partial or total delegation of services);*
- *Technical assistance for the efficient operation of regulatory bodies;*
- *Search for financial independence of companies (or authorities).*

In the presentation and promotion of delegated management systems, training and awareness raising should encourage action aimed at efficiency of customer service, user consultations and information conflict management.

Concerning the economic aspects, application of the “polluter pays” principle will be encouraged, as well as the introduction of suitable tariff *structures* and good business management (customer relations).

- ***For technological action***

  - *Application of mathematical models for multi-annual management of reservoirs, that enable the frequency and extent of shortages to be determined as a function of assigned regulation objectives;*
  - *Construction of groundwater vulnerability maps;*
  - *Location and automated mapping of buried water conduits and sewers;*
  - *Search for and rehabilitation of hidden leakage in water supply systems;*
  - *Application of mathematical models for simulating water supply and sewage systems as a support tool for monitoring losses in water supply systems and for the design of new ones;*
  - *Development of regional information processing systems as a management tool;*
  - *Monitoring quantitative and qualitative parameters in water supply and sewage systems in compliance with suitable regulation;*
  - *Control of main hydraulic, chemical and physical parameters in drinking water production and water purification plants to enhance their efficiency:*
  - *Promotion of feasibility studies and projects for supplying water to disadvantaged peri-urban areas*.
  - *Promotion of national scenarios and projects for a better local management of the water demand*.

3.2 Local water resources and water demand management (quantity and quality) within catchment areas and islands;

♦ ***Description***

The organisational structure of local authorities and governments operating within the region in the water sector is often ill suited to integrated management of environmental issues. Areas of a region may have common environmental problems but are usually administrated by a number of different bodies, sometimes with conflicting views as to the action to be taken, creating serious obstacles to establishing and implementing action plans and conservation programmes.

From the point of view of water resources and demand management, the appropriate geographical and administrative area is par excellence the river basin. Administrative arrangements must recognise and take account of this.

Structures for integrated basin management of water involve at least the following elements:

- ***Local, regional, and in some cases national, institutions responsible for water administration, who by mutual consent establish forms of collaboration aimed at rationalising management of the area, taking into account both mutual and specific interests of the different users exploiting the basin's resources;***

- ***Planning activities that regard the river basin as a whole and ensures implementation of actions in the water management sector with consideration for the impacts on the overall river basin***;

- ***Involvement of local users, water organisations and the general public***.

These activities will include:

- *collection and processing of data and information for the purpose of: studying the physical, ecological and human environment, examining existing regulatory and administrative constraints; analysing water availability and demand; evaluating critical risk conditions;*

- *identification of kinds of action necessary, their technological and economic effectiveness and relative priority.*

Possible topics to be taken into consideration in planning activities include:

- ***Integrated planning of the water demand and decrease of the water losses and inappropriate water uses;***
- ***Construction and management of pumping and conveyance works, control of surface water and groundwater abstraction, diversion and drainage, distribution of water and return of used water, following procedures that comply with environmental regulations;***
- ***Control of surface water and groundwater quality, with a view to preventing degradation and ensuring rational use;***
- ***Maintenance of minimum ecological flow in surface water bodies vital for sustaining ecosystems;***
- ***Flooding control to prevent rivers bursting their banks and inundation, control of extractive activities along watercourses, conservation and consolidation of hillsides, slopes and unstable areas, including protection of vegetation cover;***
- ***Regulation of navigation, including pleasure boating;***
- ***Projects to address problems on the ground.***

♦ ***<u>Importance of the priority area and impact on the Mediterranean region</u>***

The organisation of water management at the river basin level in Mediterranean countries will necessarily have differences due to the varying administrative systems, legislation, management practices, technical and financial capacity, distribution of resources and last but not least, the trans-national extension of some major drainage areas.

According to an analysis conducted by the Blue Plan/MAP in 1996, the natural water resources of the Mediterranean basin countries (i.e. the total mean annual volume derived from normal levels of precipitation on the surface area) amounts to 985 km^3/year, 74% is found in the North (Albania, France, Greece, Italy, Malta, Monaco, Portugal, Spain, the former Yugoslavia), 21% in the East (Cyprus, Jordan, Israel, Lebanon, Palestinian Authority, Syria, Turkey) and only 5% in the South (Algeria, Egypt, Libya, Morocco, Tunisia).

In many Mediterranean islands surface water is often scarce or even periodically lacking due to the prevailing semi-arid climate, while groundwater resources are highly vulnerable to the impacts of human activity. Commonly there is competitive use for limited water resources leading to overexploitation and short- or long-term depletion in quantity and quality.

Agriculture and industry consume substantial amounts of an island's natural waters while polluting in the same process. Irregular patterns of demand as a result of the seasonal influx of tourists in Mediterranean islands stress further the available resources and the supply system at a time when demand for irrigation water is at its peak.

Rapid population growth in Mediterranean islands during the past decades has strained their naturally occurring water resources. Today, there is an urgent need to adopt a more rational approach conductive to the efficient and conjunctive exploitation of a variety of water resources that reduces dependency on the more expensive desalinated sea water.

Most river basins in the Region are rather small in size while 21 basins have surface areas of more than 10.000 km^2. Some major river basins are transboundary with a corresponding need for addressing access to shared water resources and impacts on the quality of water up and down stream in the basin.

Furthermore, the pressure exerted by abstractions from and discharges into water bodies creates, in many cases, tensions and emergency situations both as far as quantities and quality of water is concerned.

These ecological, social and economic reasons all call for the establishing and implementing of water resources management at the river basin level as a crucial strategic re-orientation for the Mediterranean countries. Demand management should be one of its important components.

♦ ***Suggested Actions***

It is essential that action be taken in both with respect to administrative organisation and to planning to enable establishment and implementation of integrated management of water resources and demand at the basin level. The integrated management has the objective of achieving sustainable supply levels, to meet water demands cost-effectively and to involve all stakeholders. Establishing of a status definition of water resources and protection and conservation of water resources is generally necessary but particularly important for islands.

Possible actions could take the form of demonstration projects, technical assistance and training on the following topics:

➢ ***For administrative reorganisation***

- *Amendment and integration of existing legislation to enable procedures for implementing actions in the river basin;*
- *Comparative analyses of the institutional, technical, social and economic aspects of alternative solutions oriented towards basin management in a long-term sustainable development perspective; Particular attention should be paid to the conditions of islands. Policies could be guided by criteria included in the proposed EU water framework directive drawing upon the areas of action proposed in this document;*

- *Encouragement of creation of basin authorities to facilitate co-ordination between administrations responsible for the basin and to guarantee integrated management of water resources by co-ordinating planning and implementation of actions;*
- *Exchange of experiences between bodies responsible for basin management.*

➢ ***For planning***

- *Development of a river basin information processing system, appropriately updated, to enable use of the data collected (diagnosis of state of resources, user know how, resource-demand regulation) to support planning and decision makers in administrative bodies. Using Geographic Information systems (GIS) the information systems will allow for the preparation of thematic maps for the purpose of gaining knowledge of the territory and for the detection of potential risk situations utilising global water resources monitoring tools (SEQ).*

- *Preparation of the river basin master plan (long term and priority action plan), structured in the same way as a regional sectoral plan with criteria, direction, prescriptions, regulations, actions and priorities aimed at the conservation and management of water resources of the basin.*

Best available techniques should be identified and applied to combine rational use of natural water resources with other non-conventional sources of supply, notably reuse of treated sewage and wastewater and, where appropriate desalination. Projects performed within this perspective will obviously have a very strong demonstration element in the Mediterranean context and will offer a valuable opportunity for training and transfer of information and know how.

Actions related to planning and particularly targeted to the situation on islands include:

- *Definition of sustainable strategies for the rational utilisation of water resources in islands;*
- *An action plan identifying the most cost-effective methods for the development of water resources and the improvement of the water demand management;*
- *A set of operational guidelines recommending:*
  - The most suitable treatment for specific situations;
  - Application scenarios for non-conventional sources (e.g. treated sewage effluent);
  - Water conservation procedures;
  - Targeted quality standards;
  - Optimised abstraction rates;
- *An updated legislative framework;*

The project activities shall comprise:

- ***Water Resources Assessment***
  This should include a thorough assessment and a rigorous stock-take of the present situation. Historical data shall be compiled and verified with the setting up of data banks suitably interfaced to GIS.

- ***Analyses***
  This should comprise water balance computations, model simulations of different abstraction scenarios, assessment of water catchments (basins) with volumetric modelling, statistical analysis of consumption trends, water quality assessment, building of network-models, analysis of network flow regimes, identification of losses, assessment of pollution hazards and assessment of sewage availability.

- ***Decision making and master planning***
  On the basis of the water resources assessment the most appropriate methods of water supply and water treatment should be identified to meet demand cost-effectively, integrated tariff structure proposed and future management policies defined. A coherent and comprehensive master plan will be finally integrated containing freshly revised policies for water resources management and accompanied by a set of actions with operational projects and their relative cost, required to achieve the desired efficiency standards and the necessary improvements.

- ***Projects to address problems on the ground***

3.3 Water scarcity management and combating drought;

- ***Description***

Drought can be defined as a significant decrease below mean precipitation over a period of time that varies for each geographic zone. Drought is one of the most complex and least understood natural phenomena. Recurrent drought is on the increase and is of particular concern in countries and regions characterised by scarcity of water resources and strong variability of rainfall. The beginning and end of drought are difficult to forecast.
Drought tends to have more dramatic impact on semi-arid and arid areas.

Climate change is expected to further exacerbate the situation with recurring longer periods of drought in some areas.

Depending on its duration, intensity and geographical extension drought may have serious consequences on the quality of life of the affected populations and on all economic activities, especially irrigated agriculture. This is aggravated, in particular, in areas without integrated water management. Its effects may be on the quality and quantity of water stored in reservoirs, on water flow in watercourses and on groundwater and aquatic or terrestrial ecosystems.

Monitoring of drought is of major interest both to enable adoption of policies for responding appropriately to drought and to study the causes and possible evolution of this phenomenon with a view to developing methods for forecasting drought, including the effects of possible climate change.

Appropriate early response to prolonged periods of drought is often not integrated into water management. Drought phenomena are most often managed as emergencies without the proper overall adjustments in basic water management systems. Too much focus has been put on construction of excessively large reservoirs and storage capacity, rather than on appropriate proactive management of the reservoirs. It is important to change this practice and ensure that water management systems in areas with recurrent drought fully integrate long term as well as emergency measures into its management system and practices. One important action therefore is the development of appropriate management of reservoirs and water storage practices in preparation for periods of increased scarcity and drought.

- ***Importance of the priority area and impact on the Mediterranean region***

The Mediterranean region's particular vulnerability to extended periods of drought must be considered within the regional water policy. The Mediterranean has low per capita water availability with water availability unequally distributed in space and time both at the regional level and within each country. Eight countries, with a total population of 120 million have water a availability of less than 1000 m^3 per capita per year and in the present situation demand management and use of non-conventional resources are practically the only actions possible.

Six out of these countries with a total population of 30 million now lie below the subsistence level of 500 m^3 per capita per year. In these countries water resources are exploited in their entirety, or seriously overexploited.

Water demand has risen dramatically over the last decades, mainly due to three factors: population growth, tourism and irrigated agriculture. Population increase has concentrated on large urban areas, resulting in a corresponding diversion of water supply to these areas. The trend is less marked in the North than in the rest of the Mediterranean basin.

The tourist sector is growing and the Mediterranean area attracts more tourists than anywhere else does in the world. Tourism is characterised by a strong seasonal variation in water demand with peaks in the summer when resources are at their lowest. Increase in water demand is, in turn, concentrated along the coast. Water demand in this way is being shifted towards satisfying the needs of the tourism industry and to include changes in choice of crops in agriculture.

In the Mediterranean the age-old practice of irrigation typical of Mediterranean civilisations still takes up an overwhelming 80% share of total water consumption. Except for the northern countries where irrigation complements rainfall, in the South it is the main source of water for crops. Furthermore, water for irrigation is being strained not only to satisfy food requirements for national consumption, but also for growing crops for export.

The increased water demand has led to the construction of water regulation works, dams, extensive exploitation of groundwater and large scale transfer of water between basins.

Overexploitation of water resources, combined with soil erosion due to unsustainable agricultural practices, deforestation and improper land use management over the last decades has lead to serious degradation of nature and vegetation and consequent loss of water-holding capacity thereby increasing the risk of extensive desertification, in particular in the Mediterranean area. The effects of recurring extended periods of drought will further aggravate this situation.

- ***Suggested Actions***

Drought management has been addressed at the Mediterranean level by organisations such as the Water Initiative, the Mediterranean Water Network, the Mediterranean Commission for Sustainable Development, CEDARE and ACSAD, and at the national level by almost all Mediterranean countries.

The following lines of future work should be pursued:

- ***Collect information and data on drought*.**
  Available meteorological and hydrological information and data as well as ecological data should be gathered, such as for example the information and data collected within the relevant projects financed by the European Commission (DG XII) including the MEDHYCOS project in order to be able to adequately assess this phenomenon.

- ***Assessment and indicators of drought evolution for management purposes***
  This implies defining a system of common indicators and parameters in order to establish comparable criteria and methods for defining, characterising and monitoring the evolution of drought. This could imply developing methods for evaluating the risk of drought for large homogeneous zones of the Mediterranean and guidelines for long term planning and emergency plans

- ***Thematic study of drought management tools*.**
  This study should be concerned with water management measures, especially the use for strategic purposes of groundwater, the interconnection of different water supply systems and the use of non-conventional resources, as well as strategic elements for demand management, including the adoption of a tariff system.

- ***Study on "Drought: actions, impact, strategies***"
  This will involve gathering information and experience on a national level concerning monitoring of emergency situations, preventive measures adopted and their effectiveness, the resulting social, economic and environmental impact.

- ***Assistance to the development of a legal framework to cope with drought***.
  This framework should allow authorities and managers to take decisions in preparation and mitigating of the effects of drought, rationalising water use and making financial instruments available for implementing the actions required for efficient management both in emergency and normal situations.

- ***Desertification is being addressed within the context of the UN Convention for Combating Desertification*** UNCCD following up the 2nd conference of the parties held in Dakar in December 1998. Italy holds the Presidency for Annex IV for co-ordinating the preparation of the Regional Action Plan to be completed by the year 2000. The National Committee set up in Italy for combating drought and desertification has drawn up interesting proposals for action in this context.

- ***Projects to address problems on the ground***

3.4 Irrigation water management

♦ ***Description***

Irrigation is a basic tool for stimulating the development of rural populations and for increasing food production. In certain geographic areas, such as the Mediterranean, irrigation is a prerequisite for development. Irrigation is also the highest consumer of water resources in the Mediterranean region and present use patterns as well as any changes in the future are in urgent need of an overall integrated water management approach.

The main problems are the decreasing water availability and increasing negative impact on aquatic ecosystems and groundwater resources due to excessive water abstraction. Modernisation of existing irrigation schemes and demand management aimed at optimising physical and economic efficiency in the use of natural water resources and recycled water is essential for a new irrigation policy. Public investment policies aimed at improving access to available water resources should be based on integrated water management, respect for the environment and as an important element promote better practices for wise use of water in agriculture, including recycled waste water.

Accordingly, irrigated agriculture in the Mediterranean area today finds itself at the threshold of potential dramatic challenges and radical restructuring not only due to the serious environmental consequences of the present use pattern but equally importantly due to foreseeable impacts of the Euro-Mediterranean Free Trade Area, in particular if it would be extended to the agricultural products. There is an urgent need to define its future strategy in terms of what agriculture should produce and how.

Irrigated agricultural production will have to be adjusted to allow for planned and managed allocation for irrigation water consumption. Priorities of a social and environmental nature should also be considered.

Moreover, a new irrigation policy should be developed within the joint perspectives of integrated rural development and environment policies, not as a separate economic sector.

♦ ***Importance of the priority area and impact on the Mediterranean region***

In the Mediterranean, land under irrigation amounts to 16 million hectares and over the last few years this figure has risen by roughly 200,000 hectares per year. This increase equates to an increase in irrigation water consumption of some 2,000 Hm^3, equal to around 70% of total water consumption, not accounting for countries in the North.

Considering this rapid expansion, many irrigation systems have poor efficiency on account of the irrigation techniques adopted, inadequate management systems and ill-structured policies

Provisioning of the required quantities of water for irrigated agriculture in the Mediterranean is the predominant interest, whereas the importance of a rapidly declining water quality is underestimated. Attention must be paid to the need for setting up mechanisms for integrated management of water quality and quantity.

In the future, irrigated agriculture in the Mediterranean will have to face up to sustainable use of water, including producing more with less water. This calls for efficient management, adequate supply systems and proper maintenance of irrigation infrastructures, and examination of cropping patterns.

The expansion of areas under irrigation differs from one country to another. In those countries where a large percentage of water is used in agriculture, the increase in irrigated land should be accompanied by a corresponding efficient use of water and/or the use of treated wastewater.

However, in many of these countries the majority of good farmland has already been developed for irrigation and any new schemes are bound to be proportionally more costly to build.

The price of water should be considered as an integral element of integrated water management. Most Mediterranean countries subsidise irrigation water, supplying cheap water mostly with the public sector financing the irrigation infrastructures. Thus new tariff systems need to be worked out whereby the user bears (most of) the real cost of water. Furthermore, water rates should be calculated in relation to the irrigation system used and based on measuring the water actually consumed by the user.

However, in a system characterised by water scarcity, economic measures alone do not suffice to guarantee efficient water use. Water distribution facilities need to be improved and rights of use appropriately regulated.

♦ ***Suggested Actions***

Because of its importance in the Mediterranean Basin the issue of irrigation water has been addressed by numerous institutions and from many different standpoints, and is assigned priority status in the Rome Charter. These include the Water Initiative, the Marseilles Conference, CIEHAM, the Mediterranean Water Network, ACSAS, the Mediterranean Commission for Sustainable Development, and the SMAP. The work conducted so far points to some suggested actions for the future:

- ***A feasibility study on the "Modernisation of irrigation in the Mediterranean***", based on strategies defined at the national level. Allowance needs to be made for the information provided by and the needs of irrigation organisations. Best practices as well as technical aspects of modernisation should be addressed alongside the possible effects on food production and marketing. The social and environmental impact of modernisation should also be considered.

- ***Training and transfer of technology and know how on the use of treated wastewater*** in agriculture. The objective is to define basic regulations for the reuse of wastewater, which should also include good practices.

- ***Training and transfer of technology and know how, including experience with best practices on the use of non-conventional or marginal sources of water in agriculture, especially saline water***.

- ***Creation of a forum for the mutual exchange of experiences among irrigation water users, in particular the Land Improvement Agencies***.

- ***Setting up mechanisms for facilitating end-user participation in water management.*** This participation is essential for the development of sustainable irrigation policies and should be extended to all fields.

- ***A study on "Application of economic and management tools to the irrigation sector".*** This study should concern water rates and taxes as well as aspects connected with the water market and the possible privatisation of water distribution. The ultimate objective is to create a Mediterranean map that reflects the state of application of economic instruments and the results obtained.

- ***Projects to address problems on the ground***

3.5 Use of non-conventional water resources

♦ ***Description***

"Non-conventional" water resources may be defined as treated wastewater and desalinated seawater or brackish water.

The reuse of treated municipal wastewater in agriculture is consolidated practice in many Mediterranean countries. However, there is a need to stimulate the controlled reuse of suitably treated water (for example for groundwater recharging), since in many countries there have been numerous instances of reusing raw sewage creating major health hazards.

This is a clear "win-win" situation as urban wastewater treatment must be built extensively in order to avoid further deterioration of water resources and the environment and any productive use of treated wastewater will help improve both the pressure on water resources and the cost of operating the treatment plants.

Desalination of seawater or brackish water for industrial use or drinking water supply entails problems basically of an economic nature, whereas technology is readily available and usable. The major constraint in using this resource is the cost of the product.

Desalination therefore appears more feasible and economically competitive in insular or coastal areas with serious water shortages and preferably where low cost energy is available.

♦ ***Importance of the priority area and impact on the Mediterranean region basin***

The reuse of treated wastewater is of major interest in the Mediterranean basin. In this way better quality water would be made available for uses with more demanding quality requirements.

The possible ecological impact on the aquatic ecosystem of a substantial decrease in wastewater being discharged into rivers, lakes and coastal zones must be analysed in order to ensure the establishment of a policy sensitive to environmental protection and safeguarding water from pollution.

In Mediterranean insular regions or coastal areas suffering from severe scarcity, desalination of seawater or brackish water may represent an important tool to secure water supply, particularly because this technology becomes economically competitive with other possible sources of supply such as underwater conduits and water carriers.

For example in Malta over 60% of the available water resources come from desalinated seawater.

Where water shortage is less severe, desalination is of marginal interest, mainly limited to local situations or cases of emergency.

♦ ***Suggested Actions***

Suggested Actions for the use of non-conventional water resources includes applied studies, demonstration projects, technical assistance and training on the following topics:

➢ ***For reuse of treated wastewater***

- *Definition of objectives and parameters for the Mediterranean countries for regulating the use of treated wastewater in agriculture, with particular emphasis on hygienic aspects;*
- *Assessment of irrigation requirements, of the availability of wastewater and the choice of areas to be irrigated, taking into account the distance from the sewage disposal plant, infrastructure constraints, crop type, irrigation techniques and degree of wastewater treatment, as well as problems connected with soil degradation (salinisation);*
- *Information and public awareness campaigns directed to farmers/agricultural workers for the correct use of irrigation with treated wastewater.*

➢ ***For desalination***

- *Choice of suitable sites for installing desalination plants, near to the sea or to sources of brackish water, located in the vicinity of users and where low cost energy supply is available (e.g. coupling in dual plants for electric power generation and desalinated water production);*
- *Study and introduction of preferential treatment, such as reduced rates for electricity used for producing desalinated water in tourist resorts, hotels and small communities with water supply difficulties;*
- *Definition of alternative forms of financing for desalination plants, including resort to the private sector both for construction and management for the purpose of maintaining an efficient system and low production costs.*

➢ ***Projects to address problems on the ground***

- *They could include appropriate techniques and methodologies for use of non-conventional sources of water, including sustainable ways of rain enhancement when justified.*

3.6 Preparation of national and local scenarios for the period until 2025 that enable precise objectives to be set and action to be taken for sustainable water management

♦ ***Description***

In the water sector prospective studies are a basic tool for gaining a deeper insight into possible evolutionary trends and their impact, and contribute to anticipating and alleviating future problems.

By developing several scenarios it is possible to illustrate the main kinds of possible changes and, should the need arise, to indicate the need to search for more acceptable futures than those that result from simple projection of the observed trends.

This prospective exercise is all the more valuable if it can rely on the participation of the different actors concerned. It can then produce real shared "visions" of futures to be avoided or futures to be explored, taking into account the issues at stake, the constraints and the economic, social and environmental impacts.

This makes it easier to draw up integrated water management strategies setting specific objectives to be achieved in well-defined time limits and specifying the roles of the different actors involved.

When developing scenarios greater accent should be placed on water demand management and the economical, social and environmental aspects need to be comprehensively addressed. Water demand management, in particular the reduction of wastage, the strive for enhanced efficiency, and demand regulation, is one of the main possible and desirable areas where progress can be achieved in integrated water policy. Selection of performance indicators in the scenarios allows performance goals to be set.

♦ ***Importance of the priority area and impact on the Mediterranean Region***

In many Mediterranean countries, water withdrawals are approaching the amount of available resources Water scarcity, temporary or chronic will increase and the situation will deteriorate over the next few decades. Water scarcity is a consequence of the dramatic increase in water demand that will continue to grow.

Increasing water availability, the traditional response to water scarcity, has today or will soon reach its limit. Improved demand management (reducing unused water losses and misuse) is an important unexploited reserve. More water-saving management of resources in the Mediterranean should allow recovering significant quantities of water (75.5 km^3/year), as compared to water demand projections to 2010 and 2025.

This is why the Mediterranean Commission for Sustainable Development (MCSD) and the Contracting Parties of the Barcelona Convention feel that it is in water demand management where the most significant progress can be achieved in water policy in the Mediterranean basin and that full integration of demand regulation into water planning policies should be promoted and time horizons set for these objectives.

In addition, water demand could undergo major changes as a result of the establishment of the Euro-Mediterranean Free Trade Area (target 2010), especially if it were to cover agricultural products. This type of assumption must therefore be taken into account in Mediterranean scenarios.

♦ ***Suggested action***

The development of national and local prospective studies could include in particular:

- ***Identifying problems based on pressure, status and response indicators;***
- ***Identifying the actors;***
- ***Developing scenarios (such as on the balance between resources and requirements up to the year 2025) for different evolution hypotheses;***
- ***Assessment of water savings to be achieved and appraisal of yields and costs in terms of technical and economic feasibility, for the different scenarios; identifying difficulties to be overcome and ways of solving them;***
- ***Identifying desirable scenarios, quantifying goals (based on indicators and in accordance with time periods) and devising strategies appropriate for these targets.***

These actions could give rise to training, information exchange, know how transfer and awareness raising and mobilisation of initiatives for the actors and users involved, with a view to enhancing awareness of the need to anticipate changes and strengthen institutional capacities.

4. HORIZONTAL THEMES

4.1 Strengthening institutional capacities and training.

♦ ***Description***

Strengthening of institutional capacity building and training is internationally recognised as a top priority and the importance of this has been stressed also by the Euro-Mediterranean Partnership. Strengthening of national, regional and local institutions in all sectors is of relevance for water management. Training and education of the different operators and users is equally a high priority.

The implementation of these actions calls upon strong political will and long term financial commitment.

Capacity building is the responsibility of:

- *Governments, for adopting suitable legislation aimed at integrated water management that involves the community at the regional level, users and user associations as well as organisations responsible for water;*

- *Local communities to encourage decentralisation of the responsibilities of managing domestic water supplies and sewage disposal as well as wastewater treatment plants and irrigation networks.*

Development of human resources, such as multidisciplinary and multi-sectoral training of managers, technicians and education of the civil society, is an essential condition for optimal use of resources and project efficiency:

- *Training of highly qualified technicians and professionals should address preparation, elaboration and implementation of a strategy for rational and efficient use of water in all sectors based on integrated management principles, and include suitable practical training for the less qualified personnel;*

- *Equally important is the training of decision-makers such as managers of local communities and of non governmental organisations.*

♦ ***Importance of the priority area and impact on the Mediterranean Region***

The need for professional capacity building in the water sector and for enhancing the exchange of institutional, economic and technical information prompted the 1996 Euro-Mediterranean Conference to put forward recommendations and a draft proposal for a multi-annual regional training programme. The aim of this programme was to achieve a more efficient organisation of users and services, as well as management and optimal maintenance of domestic and industrial water supply facilities, of irrigated areas.

Moreover, this programme aimed at the dissemination of techniques appropriate for Mediterranean regions e.g. for wastewater reuse, groundwater replenishment, detection and repair of leakage and desalination**.** Capacity building in these subjects, in the use of unconventional technologies or local adaptation of technologies, in the reuse of wastewater, in groundwater replenishment and in hydro-meteorology needs further strengthening at the regional level in response to the specific needs of the Mediterranean Basin.

Manpower requirements for domestic, industrial and agricultural water services are considerable given the projection for the year 2025 of 500 million inhabitants throughout the entire Mediterranean Basin.

In most cases and at all levels institutional capacity building involves raising awareness in legislative and financial aspects. Thus it will make it possible to allow application of the “polluter pays principle” and to enable integrated and sustainable resources management and promotion of public and private sector partnership. Raising awareness of the economic and financial implications of decentralisation also should be addressed.

♦ ***Suggested Actions***

The actions aimed at professional and institutional capacity building could include:

➢ ***Networking of training centres***

This will include setting up and facilitating the operation of a network of major training centres in the Mediterranean, with correspondents in the different national organisations involved in both urban and irrigation water management.

- ***Preparation of professional and institutional training modules, including:***

  - *Definition of the contents of training modules, based on the results of surveys already conducted to establish the requirements and priority areas;*
  - *Definition of teaching methods;*
  - *Identification and presentation of "case studies" on integrated urban and irrigation water management, implementation of legislation, of urban development plans, and all other strategic documents concerning the water sector in a given country, for the purpose of preparing material for supporting institutional and human capacity building in each non-Community Mediterranean country;*
  - *Preparation of training modules in the priority areas identified, for example: in technical (water treatment, technical management of an irrigated area), administrative, financial and legal areas (cost and forms of financial management of services, participation of the private sector, rules and regulations).*

- ***Training the trainers and local experts***

The objective is to train experts in the 12 non-Community Mediterranean countries so that they train professionals in their own countries, or to undertake and participate in strengthening the institutional and structural capacity of organisations responsible for managing water resources, water supply, wastewater treatment and management of irrigated areas).

Training could be via distance or on site teaching and could involve:

- *Organisation of regional sessions;*
- *Support for a first national seminar in each project partner country of the South, led by local trainers;*
- *Creation on internet of an on-line water training centre that integrates conventional interactive tools (downloadable modules, tutoring, forums);*
- *Strengthening the capacities of institutions, local communities and non-governmental organisations in view of decentralisation and raising awareness, by information/training sessions and exchanges of experience.*

4.2 Exchange of information and know-how

♦ ***Description***

Improving knowledge and understanding of water resources and demand at all levels is essential for managing and improving their protection and efficient, equitable and sustainable use.

It is generally recommended to promote the improvement of technology and the transfer of information and know-how, including information on best practices by means of observation and information sharing systems on water resources and their various uses.

The main actions to be taken are:

➢ ***Setting up a network of information and documentation systems dealing with water resources*.**

This network requires:

- *The gathering of documentation and its circulating to all the actors involved to facilitate the training of professionals working in the sector, to disseminate new knowledge and to raise public awareness about the most important water related issues);*
- *The creation of systems to share institutional, economic and technical documentation as well as basic information (such as directories of professional organisations or experts) working in network with several specialised documentation centres in the water sector;*
- *The definition of compatible references, computerised sharing protocols and multilingual approaches, and setting up of the corresponding networks and the training of documentalists.*

➢ ***The consolidation of regional, national and international programmes for the acquisition of basic knowledge on water resources and their uses, considering that:***

- *The strengthening of regional programmes must rely as much as possible on national programmes. Considering their geographical extension and their content, these programmes need specific financial support. Moreover, national programmes could form the object of appropriate co-operation actions.*

- *The strengthening of international scientific, institutional and technical co-operation should enable the formulation of common concepts, indicators and methodologies, with particular reference to resources, uses, state of health of water environment.*

➢ ***Setting up and improvement of integrated water resources systems, their uses and the ecosystems at various levels, in particular through:***

- *Consolidation or elaboration of integrated information systems;*
- *Development of comparable data exchange systems, based on internationally acceptable methods of measurement and analysis in the water sector, as well as on the use of appropriate reporting formats facilitating sharing of reliable information.*

♦ ***Importance of the sector and impact on the Mediterranean Region***

The 1996 Marseilles Euro-Mediterranean Conference on Local Water Management stressed the need to provide all partnership countries with widespread and detailed knowledge, especially as far as actors, available tools and documentation, techniques and methods used, programmes and results of research and training opportunities are concerned.

The existing information on these topics is fragmentary, dispersed and heterogeneous. Therefore, an effort must be made to rationalise the information, making it more readable, easily accessible and readily available.

To achieve this goal, a working group of 10 countries, co-ordinated by France, indicated how this information system, that would connect existing information sources through advanced communications technology, should be set up. The system is called "EMWIS: Euro-Mediterranean Water management Information System".

EMWIS is a project supported by the EU. EMWIS is set up as a “tool” for information exchange and, therefore, can be seen as a “tool” for information exchange regarding projects or programmes in any “approved” action plan.

This tool of co-operation between European and Mediterranean countries will soon enable the networking and inter-linking among different existing information systems.

According to the Marseilles Conference recommendations, EMWIS has been developed as an information-sharing tool on five priority fields: institutions, documentation, training, research, data management.

EMWIS, therefore, could be the appropriate tool for exchange of information and experience related to this Euro-Mediterranean Action Plan on Local Water Management.

EMWIS is a collector/provider of information and is meant to facilitate connections among Partners, mostly by making available such information on its web page. As EMWIS itself develops, it would need to focus its operation in a way to cope also with the above-mentioned points related to the Action Plan, which remain within its current mandate.

♦ ***Suggested Action***

- The information provided so far by the EMWIS web page would need to be completed with complementary data to cover the needs of this Action Plan. Partners and future project co-ordinators are invited to co-operate with the Steering Committee and the technical team of EMWIS, to this end;

- EMWIS needs to be extended to all Euro-Med Partners. Focal points designated by each Partner would facilitate both collection of necessary data by EMWIS and access of Partners to information;

- Dissemination of information on "success stories" as regards integrated local water management in the Mediterranean would be of great interest.

4.3 Transfer of know-how and technology

♦ ***Description***

To ensure transfer and development of technology and know-how, including experience with best practices effectively contributing to the development of local water management, the following need to be strengthened:

➢ ***institutional/management capacities to***:
- *Identify particular experience in technology transfer through suitable benchmarks;*

- *Draw up terms of references to enable choice of the most complete, qualitatively most appropriate and economically feasible solutions for the specific context/problems.*

➢ ***capacities of suppiers of technology and management services to:***

- *Prepare information systems in order to single solutions for the success in the medium and long term of the technology transfer.*

♦ ***Importance and impact on the Mediterranean Region***

Technology is usually transferred from the more developed countries to the developing ones. In the water management sector this is only partly true. In particular Partnership countries have developed diversified technologies and know-how specialising in certain fields dictated by peculiar local conditions

Some countries have thus built up a know-how on specific problems, gaining a wealth of experience that could be drawn on by those countries faced with similar problems.

Thus, application of a North-South transfer model is not feasible in this context, but rather the possibility should be explored of transferring solutions developed for areas with similar environmental, social and economic conditions.

Fruitful co-operation could be established, for example, in the area of water scarcity management between southern Mediterranean countries. On the other hand, as far as water quality is concerned, technology and techniques developed within the European Union and its Member States could be usefully applied to solve problems of water quality in coastal areas.

Any transfer or development of technology, know-how and best practices must be adapted to the regional context and made compatible with the management practices adopted in the region.

♦ ***Suggested Actions***

Possible action to ensure a beneficial transfer of technology and know-how in the water sector could include:

➢ ***Survey of:***

- *Problems for which institutions and management bodies envisage investments and of technological approaches adopted by the different countries for solving these problems;*

- *Technology and management techniques used in Euro-Mediterranean Partnership states to respond to the problems identified;*
- *Successful experiences with problem solving through technology transfer by institutions and water management agencies.*

➢ ***Identify successful experiences that suitably re-elaborated could serve as reference for benchmarking studies focused on the best practices concerning:***

- *Drawing up of supply contracts and supply management by institutions/managers;*
- *Adaptation of the technology to the context/problem and tailoring the offer to the customer's specific needs;*
- *Facilitating contacts and strengthening relations between institutions and managers to facilitate the transfer of experience from institutions to managers who have already successfully solved problems of mutual interest in similar contexts, and define the best practices for managing the purchase of supply.*

4.4 Awareness raising, mobilisation and promotion of commitment of the population

♦ ***Description***

Informing and educating the users is internationally recognised as a high priority to ensure that for users to become actors in the management process. This should be ensured in a participatory approach of society as a whole, and targeted to particular user groups, including women.

A programme of activities should be prepared with a view to creating and consolidating education in water use involving as actors:

➢ ***users***
➢ ***water companies***
➢ ***institutions***

The objective of this programme is to ensure widespread understanding of the importance of water as a precious and vital element that requires rational management, taking into account environmental sustainability, respect of water resources, efficiency of technical solutions and the principles of social solidarity.

➢ ***Educating the user***

Domestic, agricultural and industrial users should be made aware that:

- *It is imperative to use water properly. Water is an economic asset and as such should not be wasted but conserved and managed in a sustainable way. It is a natural resource to be used with respect for other users and future generations.*

- *The right price has to be paid for the use of water and this will take into account capital and running costs making sure that water companies are remunerated*.

These are key elements for affirming the economic value of water and the need for qualified and capable managers in the water services sector. The principle of solidarity towards the needier users can be safeguarded by ensuring that public institutions grant direct aid to those who are entitled to it, doing away with subsidies to water companies that may mask, in some cases, inefficient and uneconomic management.

➢ ***Educating water companies***

Water companies should aim at achieving three basic goals:

- *Perform effective and efficient water management*
- *Provide a good service*
- *Ensure economic viability of the services of the company*

Water resources management by the water services should be made within regional or national plans for integrated water resources management and take into account the conditions within the river basin as a whole.

Indicators for measuring the quality of the service provided should be developed. Such “performance indicators” are a useful tool both for the water company for controlling their technological and management processes and for regulatory bodies and users for assessing the quality of the service delivered including the extent to which the services fulfil quality requirements.

➢ ***Educating the institutions***

Water is a public asset and as such belongs to everybody. Thus institutions are obliged to control its use. This can be achieved in two ways:

- *Controlling that the user and water utilities have the proper attitude: this means checking the effectiveness of the actions implemented for enhancing user awareness, taking corrective measures where necessary, and controlling the quality of the service provided by the utilities, as well as investment and maintenance plans.*

- *Controlling and promoting water "conservation". "Conservation" is a term used especially for water and one that best expresses the respect for this element. Water conservation means: storing it when there is an abundance, reducing wastage, safeguarding its quality.*

Educating the user, the water companies and the institutions are all important, as:

- *Lack of information or misconduct of the user makes rational and sound management difficult;*
- *An unsatisfactory service or a water company running at a loss is not conducive to good management and may lead to neglect or underestimation of the need for maintenance of distribution network and installations, education of staff and lowering the standard of the service provided;*
- *The lack of adequate knowledge and experience, of a legislative and economic framework or indifference of public institutions makes rational and sound management difficult.*

Consequently, any programme to be developed on "awareness raising, mobilisation and commitment of the population" should consider all three issues.

♦ ***Importance of the priority area and impact on the Mediterranean Region***

"Awareness raising, mobilisation and commitment of the population" has been assigned top priority in Mediterranean countries as the improvement of water resources management implies not only technological and process innovations but also changes in the behaviour of the users, water companies and institutions.

Actions should provide new incentives and values to induce attitudes in keeping with the requirements for the safeguarding and proper management of water resources.

The development of "Awareness raising, mobilisation and commitment of the population" must take account of cultural, civic, social and religious differences that exist within the Mediterranean region.

♦ ***Suggested Actions***

The projects carried out to date have been concerned mainly with awareness raising campaigns or have resorted to penalty systems to discourage undesirable behaviour, though sometimes the results are difficult to verify.

Presumably in certain Euro-Mediterranean contexts initiatives have been undertaken that have been met with success, and these experiences could form the basis for studying transferable models of action.

Possible actions might concern the research and development of models of awareness raising, mobilisation and commitment of the population adapted andadaptable to different contexts and applicable to the problems arising therefrom.

Specific objectives of actions could be:

- *To classify actions in the fields of awareness raising and education in water use and identify conditions, factors and success indicators for each kind of action;*
- *To identify previous experience gained at a European and Mediterranean level and similar, significant initiatives world-wide, including in different but comparable sectors (such as environmental education and health education);*
- *To set up, disseminate and transfer models and technical and management know-how for drawing up, implementing and monitoring action aimed at awareness enhancing and education in water use;*
- *To put into operation in actual and significant contexts and concerning a variety of problems the developed models and assess to what extent the action taken has been effective.*