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IWR
Integrated Resources
MANAGEMENT

The background of the title is an abstract painting. It features a central, somewhat ethereal face or figure rendered in shades of blue and white, surrounded by vibrant, swirling colors of red, green, and yellow. The overall style is expressive and textured, with visible brushstrokes and splatters.

in the
MEDITERRANEAN

M.SCOULLOS

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INTEGRATED WATER RESOURCES MANAGEMENT IN THE MEDITERRANEAN

1: GWP-Med
2: MIO-ESCDE
3: MedWet



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Mediterranean (GWP-Med)**

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Cover Artwork: M.Scoullou
Artistic Design: Art in Design - Creative Advertising

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ISBN: 960-86312-8-9

This publication should be cited as:
Scoullou M., Malotidi V., Spirou S. and Constantianos V., "Integrated Water Resources
Management in the Mediterranean", GWP-Med & MIO-ECSDE, Athens, 2002.

Athens 2002

The Global Water Partnership - Mediterranean (GWP-Med)

The Global Water Partnership-Mediterranean (GWP-Med) is a Regional Water Partnership of the Global Water Partnership (GWP). GWP-Med, in its present form, was created in 2002 and it is the successor partnership to the Mediterranean Technical Advisory Committee of GWP (MEDTAC).

GWP-Med is a platform bringing together competent organisations working regularly on water issues in the Mediterranean region. GWP-Med goal is to promote and exchange knowledge on IWRM for the sustainable use of the region's water resources.

To achieve its goal, GWP-Med:

- Promotes and sustains a strong partnership in the Mediterranean among competent organisations that have an impact on water management.*
- Makes the principles of sustainable use and integrated management of water resources (IWRM) widely known, recognised and applied by countries and all other stakeholders in the Mediterranean, through appropriate mechanisms for sharing information and experience.*
- Supports exemplary actions at local, national and regional level that demonstrate the value applicability and positive impact of the above principles.*
- Seeks and facilitates the appropriate international funding and involvement of international institutions for activities promoting IWRM.*
- Introduces, helps to implement and adapts to the specificities of the Mediterranean region, global initiatives launched or adopted by the GWP.*

To deliver its work in the region, GWP-Med has a governance structure with four bodies: Membership Platform, Partnership Council, Advisory Board, and Secretariat.

Currently, the GWP-Med Membership Platform brings together 7 major Mediterranean networks of major stakeholders and, furthermore, 32 competent organisations, institutes and companies.

The present members of the Partnership Council are representatives of the following regional networks:

Blue Plan (MAP/UNEP)

CEDARE - Centre for Environment and Development in the Arab Region and Europe

CIHEAM - International Centre for Advanced Mediterranean Agronomic Studies

IME - Mediterranean Institute for Water

MedWet - The Mediterranean Wetlands Initiative

MIO-ECSDE - Mediterranean Information Office for Environment, Culture and Sustainable Development

MWN - Mediterranean Water Network

At present, GWP-Med while solidifying and expanding the regional partnership, is working to achieve its main goals through its elaborate annual Work Programme of activities which focuses on the following areas:

- 1. Establishing on the ground partnerships*
- 2. Developing awareness and changing attitudes towards water management*
- 3. Supporting established alliances*
- 4. Forming alliances with key international and regional organisations*
- 5. Generating and disseminating knowledge about IWRM good practices*
- 6. Supporting dialogue on key IWRM issues*
- 7. Completing regional Frameworks for Action and prioritising actions*
- 8. Identifying and supporting special studies*

Some of the specific topics which GWP-Med's work focuses on are:

- Effective Water Governance*
- Raising of Awareness and Political Will for IWRM*
- Educating the Youth about Water*
- Groundwater Management*
- Drought Management*
- Water, Food and Environmental Interaction*
- Water and Poverty*
- Water and Climate Change*
- Water Demand Management*

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Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE)

The Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE) is a Federation of Mediterranean Non-Governmental Organizations (NGOs) for Environment and Development. MIO-ECSDE has since 1991 been acting as a technical and political platform for the intervention of NGOs in the Mediterranean scene. In co-operation with Governments, Intergovernmental and International Organisations, as well as other socio-economic partners, MIO-ECSDE plays an active role in protecting the environment and promoting the sustainable development of the Mediterranean Region.

Main objective of MIO-ECSDE is to protect the Natural Environment and the Cultural Heritage and its ultimate goal is to promote Sustainable Development in a peaceful Mediterranean.

Major tools and methods used by MIO-ECSDE in order to achieve its objectives are the following:

- Promotion of understanding and collaboration among the people of the Mediterranean, especially through their NGOs, between NGOs and Governments, Parliaments, Local Authorities, International Organizations and socio-economic actors of the Mediterranean Region at all levels.*
- Assistance for the establishment, strengthening, co-operation and co-ordination of Mediterranean NGOs and facilitation of their efforts by ensuring the flow of appropriate information among relevant bodies.*
- Promotion of education, research and study on Mediterranean issues, by stimulating collaboration between NGOs and scientific and/or academic institutions.*
- Raising public awareness on crucial Mediterranean environmental and social issues, through campaigns, publications, exhibitions, presentations, etc.*

MedWet - The Mediterranean Wetlands Initiative

The MedWet initiative, guided by the Mediterranean Committee (MedWet/Com) of the Convention on Wetlands (Ramsar, 1971), is a long-term, collaborative effort towards the conservation and wise use of the Mediterranean wetlands. The MedWet initiative mobilises partners and funds to assist in implementing the Ramsar Strategic Plan in the region. MedWet brings together all governments of the Mediterranean region (25), the Palestinian Authority, the UNDP, the EU, the Barcelona, Bern and Ramsar Conventions and 8 international NGOs and wetlands centres. Basic parts of the MedWet activity are the conservation actions at wetlands (especially Ramsar Sites) and the promotion of national wetland policies. MedWet also provides a forum for regional experience at technical level and publishes a range of wetland management methodological tools.

The main bodies of MedWet structure are: the Mediterranean Wetlands Committee (MedWet/Com) which guides the MedWet initiative and in which the Mediterranean states are represented, the Coordination Unit and the Scientific/Technical Network. Also, the MedWet/Regions Network is operational including 8 regions.

MedWet collaborates with the Regional Activity Centre RAC/SPA of the Barcelona Convention and it is also a member of the Mediterranean Commission on Sustainable Development (MCSD), and of the Global Water Partnership-Mediterranean (GWP-Med).

The main fields of activity of MedWet are:

- improving the knowledge on wetlands*
- increasing appreciation of wetlands values*
- using wetlands resources in a sustainable way*
- managing the wetland water resources*
- maintaining and enhancing the biodiversity of wetlands*
- achieving integrated management of wetland sites*
- developing and implementing national wetland policies*
- strengthening international collaboration*

PREFACE

Water was recognized since the antiquities as the “blood of the Earth”, as the prerequisite for life in our planet and as one of the most vulnerable and scarce natural resources, where some of the first serious pollution problems were recorded. The need for careful and wise management of water resources was recognized in Stockholm, in 1972. In 1977 the term *integrated water resources management* (IWRM) was introduced in the Conference organized in Mar del Plata as an attempt to resolve conflicting uses of water resources. In the 1980’s water management followed different diverse, mostly sectoral approaches with emphasis on regulation, technological solutions and water quality monitoring, with minor attention to the water quantity issues. The former were approached almost entirely from the supply side. In preparing for Rio, 1992 it became clear that water management was not that high in the international agenda, although it was already recognized in the Mediterranean one (see Athens Declaration 1991). The Dublin International Freshwater Conference of 1992 attempted to stimulate action and place in the picture IWRM in a systematic way, based on key principles. In the results of UN Conference on Environment and Development (Rio de Janeiro 1992) and other major UN Conferences that followed (“Rio+5” CSD, 1998) water issues emerged as some of the most pressing and cross-cutting through all sectors. Two international bodies were set up to address them: the Global Water Partnership (GWP) and the World Water Council (WWC) and the 1st World Water Forum was organized in Marrakech, in 1997.

Meanwhile, the Mediterranean countries have agreed on a Regional Mediterranean Agenda 21, where water management occupies a central position and with the Revision of the Barcelona Convention in 1995, the Mediterranean Commission of Sustainable Development - MCSD was established. Within it, a Task Force on Freshwater Management was set up and produced relevant recommendations (Frejus, 1997).

The developments since then were rapid. The meetings of the UN Commission on Sustainable Development CSD 6 and the Paris Water Conference of 1998, the 2nd World Water Forum in The Hague in 2000 and the International Conference on Freshwater in Bonn 2001 placed IWRM in the very center of the water issue as a feasible answer to the accumulated water problems and as a way to avoid further water crisis. The Millennium Declaration, UNCSD 10 and the outcomes of the World Summit on Sustainable Development (WSSD, Johannesburg 2002) focused on water and included a target for all countries to elaborate IWRM plans by 2005, a commitment closely linked to the water supply and sanitation targets. As a response to these, the EU Water Initiative (EUWI) was launched in Johannesburg and its Mediterranean Component will be instrumental in reaching the targets set in the region.

However, despite the fact that it is important that IWRM become first known and accepted in International Fora as the basic framework for effective management and governance of water resources, little can be achieved until IWRM is understood and applied by the water managers themselves and all stakeholders dealing with water issues at various levels.

The present small publication attempts to present and clarify IWRM and to provide the necessary information and tips in order to facilitate the access of the interested Mediterranean stakeholders to the concept and application of IWRM.

Michael Scoullos
Chairman of GWP-Med
Chairman of MIO-ECSDE

CONTENTS

1. IWRM DEFINITION

2. WHY IWRM

3. GLOBAL & MEDITERRANEAN PRESSURES & CHALLENGES

3.1 WATER RESOURCES UNDER PRESSURE - POPULATIONS UNDER WATER STRESS

3.2 UNSUSTAINABLE WATER MANAGEMENT & USES

3.3 ENVIRONMENTAL RISKS

3.4 GOVERNANCE/MANAGEMENT CRISIS

4. THE CONCEPTUAL FRAMEWORK FOR IWRM

5. THE FOUR WATER PRINCIPLES OF DUBLIN

6. THE CONCEPT OF INTEGRATION

7. APPLYING IWRM: THE TOOLS & METHODS

7.1 WATER POLICY

7.2 WATER LAW

7.3 CATCHMENT MANAGEMENT STRUCTURES

7.4 CIVIL SOCIETY, COMMUNITY & USERS' PARTICIPATION

7.5 WATER RESOURCES ASSESSMENTS

8. THE GWP TOOLBOX

9. MORE GWP PUBLICATIONS ON IWRM

CONCLUSIONS

REFERENCES

1. IWRM DEFINITION

...equitable human welfare in balance with the ecosystems' sustainability ...

As it was stated in the Agenda 21, Chapter 18, Paragraph 18.6: *“the holistic management of freshwater as finite and vulnerable resource and the integration of sectoral water plans and programmes within the framework of national economic and social policy are of paramount importance for action in the 1990s and beyond”*. To this end, the Integrated Water Resources Management (IWRM) process has as main objective to assist countries in their endeavour to deal with water issues in an efficient and sustainable way.

IWRM is a process which promotes the co-coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

GWP/TAC'

2. WHY IWRM

...the need for an integrated approach...

Many countries in the world in their struggle for economic and social development are facing challenges related to water resources. Increasing demands in water, deterioration of water quality and quantity and mismanagement of natural resources make water an even vulnerable and finite resource. The latter is more evident in the Mediterranean region where the sectoral approaches in water management are still prevailing in many countries and cannot meet the contemporary needs for a sustainable resources management. The region needs an overall management strategy looking at the entire water cycle and integrating the environmental, social, and economic parameters. In addressing these, the three basic pillars of IWRM are: the enabling environment of appropriate policies and laws, the institutional roles and framework and, the management instruments for the institutions to apply on a daily basis. In the following chapter the contemporary pressures and challenges for IWRM are further presented at global as well as at Mediterranean level.

3. GLOBAL & MEDITERRANEAN SITUATION & CHALLENGES

The Mediterranean region through its natural, social and developmental diversity (as it separates two neighboring areas with opposite demographic characteristics and levels of development) is considered as a representative of North-South interfaces for the rest of the planet. Thus, it is regarded as a life-size laboratory for the World Vision exercise, concerning the water resources situation and management, in particular.⁴

3.1 WATER RESOURCES UNDER PRESSURE - POPULATIONS UNDER WATER STRESS

Global level

The Earth's water resources are under increasing pressure and this is mainly due to population growth and human activities. The numbers are revealing: the world population has increased from 3 billion people in 1960 to 6 billion in 2000, while global water withdrawals have increased by a factor of four². On the other hand, over one billion people lack access to safe drinking water and more than two billion people lack access to sanitation. The majority of these people live in low income countries. The challenge set by the Millennium Development Goals and recognized in the Plan of Implementation in Johannesburg is to halve the proportion of people who don't have access to safe water and sanitation by 2015.

Mediterranean region

Population dynamics constitute the dominant factor in the economic, social and environmental evolution of the Mediterranean. The resident population of the Mediterranean countries has jumped from 246 million in 1960 to 427 million in 2000 and is expected to be 550 million by 2025³. This demographic situation in combination with the intensive urbanization accentuates the concentration of population and activities, mainly in the coastal areas. Additionally, for the majority of the Mediterranean countries more than 80% of the population has access to safe drinking water, but it decreases to 60% or less in the rural areas of the South⁴. Access to sanitation lags behind the drinking water-supply system.

The south and east Mediterranean countries face increased competition for remaining resources. Growing water-stress in these areas poses a threat to the economic development and human livelihoods, mainly among the poorest and most vulnerable populations living in arid rural areas.

3.2 UNSUSTAINABLE WATER MANAGEMENT & USES

Global level

Water policies have been dominated for many years by a supply-oriented approach and a sectoral approach. Nowadays, such a policy orientation is unable to confront the growth in demand, the competition for water resources by the various economic sectors and the rising serious environmental problems. Globally, agriculture uses as much as 70% of all renewable water resources that are diverted for human use. This proportion reaches the 80-90% level in many developing countries. Irrigation systems are often scattered across vast rural areas, with poor maintenance and lack of managerial control and service levels. While improvements in domestic service have started, agricultural water use is still dominated by the supply-oriented approach, driven by fears of food security, making implicitly reference to the "green revolution" of 1970's and the introduction of new crops, which was based to intensification of agricultural production. As the UN Secretary General pointed out in the Millennium Conference (2000): "We need a Blue Revolution in agriculture that focuses on increasing productivity per unit of water -more crop per drop".⁵

Mediterranean region

The scarcity and disparity of the water resources in the Mediterranean region are aggravated by the different levels of exploitability and vulnerability among different countries. Currently the supply-oriented water management in some countries has increased the pressures on resources, especially in the South and East of the region. The pressure on resources is higher during summer period due to increased water demand from the tourist and agricultural (irrigated agriculture) sectors⁴. The average proportion of 72% of the water consumption in the region which corresponds to the agricultural sector exceeds 85% in some countries in North Africa while it remains the dominant water consumer even in the European Mediterranean countries^{4,6}. However, recent data⁴ reveal a gradual shift away from irrigation toward municipal water uses (including household, commercial and industrial sector), mainly in countries facing water shortages. These shifts have less to do with water-efficient and sustainable practices in agriculture than reactive responses (e.g. restrictions, changing crops). Although drinking water is the first priority and agriculture is the second one in water allocation policies in most Mediterranean countries, the "environmental demand" is virtually absent.

3.3 ENVIRONMENTAL RISKS

Global level

Water bodies worldwide serve as the recipient of huge quantities of all kinds of wastes discharges from agricultural, industrial and domestic activities. Emissions of organic pollutants from industrial activities are a major cause of degradation of water quality. Middle income countries seem to have the biggest contribution.⁷ Increasing water pollution causes the deterioration of water quality and threatens human and aquatic ecosystems health, economic development and social prosperity. In addition, the extreme variations in rainfalls and water flows whether due to climatic changes and/or due to other reasons (e.g. land mismanagement, deforestation, etc.) lead to droughts and floods followed by large scale loss of human lives and damage to economic, social, cultural and environmental assets. Among the latter soils suffer from erosion. During the 90's more than 90% of the people killed by natural hazards lost their lives due to extreme hydrological phenomena such as floods, droughts and tropic cyclones.⁵

Mediterranean region

The Mediterranean Sea faces heavy pollution problems, resulting from human activities (agricultural, industrial and residential) on land. In addition, many of the region's aquatic ecosystems are threatened because of the deterioration of water quality and quantity.⁶ The coastal ecosystems are at their most vulnerable in the face of the process to built-up the Mediterranean coasts. Urbanisation, pollution, over-exploitation of natural resources and fragmentation management approaches of natural resources pressure Mediterranean aquatic ecosystems and biodiversity. The region has lost more than the 50% of its wetlands and in some places this rate reaches the 90% or more.^{4,6} On the other hand, many parts of the region suffer frequently from years of drought, resulting from the over-utilisation of water resources and climatic changes, while urbanization, deforestation, etc. contribute to temporary floods. During the 20th century at least fifteen floods had been recorded in Mediterranean countries and each took more than 100 to 1000 victims.⁶ Sensitivity to the increased climate variability of the region would be greatest in water resources systems under demand-supply stress or due to water quality problems or where natural supply and use are closely matched, as in the case of the Southern and Eastern Mediterranean countries (particularly in their semi-arid and arid parts).⁸

3.4 GOVERNANCE/MANAGEMENT CRISIS

Global level

Some forecasts suggest that by 2025 more than 3 billion people will face problems due to water scarcity. This is not because our planet lacks water. Basically, the reason is that water resources are unevenly distributed but, more importantly, they are still undervalued and mismanaged. As it was recognized at the 2nd World Water Forum: *"the world water crisis is a crisis of governance, not one of scarcity"*. Sectoral approaches are still prevailing in water management, which is usually left to institutions with top-down decision and operation mechanisms, the legitimacy and effectiveness of which are frequently questioned. At global level the water quantities are adequate to meet the needs of all people if the way water is managed will change. Integrated Water Resources Management (IWRM) has become an accepted framework for the "effective management and governance of water".

Mediterranean region

According to the experts the future scenarios show that conflicts and interests in the region between upstream and downstream, towns and rural areas, and between the short and long term priorities will get worse, if current management and governance practices of water continue. In this context, especially in Southern and Eastern Mediterranean countries, given the demographic pressure, the major concern is maintaining the social stability. The compartmentalized water management approach, the lack of coordination and cooperation between different institutions dealing with water management at local, national, and even at regional-international level, *inter alia*, contribute to the governance and management crisis in the region.

4. THE CONCEPTUAL FRAMEWORK FOR IWRM

...domination of sectoral-oriented water management...

Water management has evolved over the years by responding to the particular needs of each sector rather than by balancing overall needs. The result has been vertically divided functions in water use and management which has made water management rather inefficient in most cases. The skeptics argue that most water management approaches will continue to be based on sectoral divisions, thus the key is to look for “win-win” solutions: *policies that facilitate immediate action and contribute to gradual structural changes within/among the sectors.*⁹ This could be done by creating an Integrated Water Resources Management (IWRM) framework in which the challenges and needs will be faced in a holistic way.

...widely acknowledged need for IWRM & but conceptually debated...

Since the Mar del Plata conference, 1977, IWRM has been advocated widely as the most sustainable means to incorporate the multiple competing and conflicting uses of water resources. While the need for an integrated approach of water management is widely acknowledged, the literature demonstrates a wide range of definitions and implementation approaches. Some analysts present IWRM from a theoretical perspective and others apply a more practical interpretation to the concept, describing it as a set of management tools that recognizes the greater interrelatedness of resources and uses with each other and within a total system.¹⁰ However, the regional and national institutions should adapt their practices to their special realities, consulting the collaborative concept and framework that it emerges globally and regionally.

...a balancing process...

So, one can say that IWRM is not a final product but a dynamic process. In fact, it is a balancing process providing for an ensemble of means, tools and methods for the development and management of water and other related resources with the objective of attaining water security and sustainability. In the framework of IWRM implementing one policy or management tool may result in the need to modify others; thus it requires vision and **political will** to introduce and mainly to implement.¹¹ By its very nature, the approach challenges existing orientations, institutional arrangements and the objectives and character of sectoral policies. Thus, the **understanding** by the people and institutions of the need for change and also the way in which change will take place is a prerequisite.

...a “twin-track” approach...

While IWRM is accepted in principle internationally, it is often considered too complex and difficult to understand and implement at regional, national or local level. Therefore, there is a strong argument by some experts and politicians that it can only be developed through working within traditional sectors and gradually developing capacities and mechanisms for integration: a “twin-track” approach. The need for an IWRM framework will require enhanced policy coordination. This is not a prerequisite for success but it certainly contributes to it as what looks extremely successful from a limited sectoral perspective is far less appealing when the wider environmental and socio-economic implications are taken into account. Creating these levels of **synergy** is far from being easy. After all perhaps the most realistic approach is to develop synergies successively with each step having a clear purpose and demonstrative benefits.⁹

5. THE FOUR WATER PRINCIPLES OF DUBLIN

The concept of fully integrated water resource management emerged basically from the Dublin International Freshwater Conference in 1992. IWRM is based on and in parallel is the vehicle for the practical implementation of the basic “water principles” that were put forward in Dublin. These principles recognise the close interrelationships among economic, social and environmental security.

1. Freshwater is a finite and vulnerable resource, essential to sustain life, development and the environment: “Since water sustains life, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or groundwater aquifer”.

Water is crucial to all aspects of human life, ensuring good quality of life and sustaining socio-economic development and welfare. Overpopulation, increasing demands in water, pollution and deterioration of water resources quality and quantity make freshwater even more vulnerable and “fragile”.

...integrating policies for maintenance of water resources and ecosystems to social and economic development...

On the other hand freshwater is a finite resource, with natural limits: the total amount on Earth is considered constant, continuously moving within the hydrological cycle. Human alterations can not be significant, despite the initiatives that are being launched (non-conventional water resources, desalinization). Thus, water management has to be implemented by a holistic approach, integrating policies for maintenance of water resources and ecosystems to social and economic development. Effective water management should attain the balance between the use of resources for the livelihood and development and the protection of the resources to sustain its functions and characteristics. In addition, water management should link upstream and downstream users of water, which means that dialogue and conflict resolution are needed in order to meet the needs of both and to reconcile them.

2. Water development and management should be based on a participator approach, involving users, planners and policy-makers: *“The participatory approach involves raising awareness of the importance of water among policy-makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects”.*

...achieving consensus & ensuring transparency and democracy...

The current fragmented framework for water management cannot meet the interrelationships among the various sectors identified at Dublin. Nowadays mostly water professionals manage water, too often on sectoral basis, without coordinating their planning and operations, without collaboration with the environmental community and within administrative boundaries. Furthermore, the most affected and interested stakeholders, the local people whose livelihoods crucially depend on wise water management, do not participate in the decision-making process. The involvement of all interested stakeholders in decision-making promotes consensus and ensures transparency and democracy in the way decisions are made and plans are implemented. The interested stakeholders might be: private sector organisations, professionals, academia, local groups, NGOs, individuals and can be involved in all stages of the public participation spectrum, from information provision and consultation, to taking part in planning, implementation and monitoring of the process, and the evaluation of the outcomes.

3. Women play a central role in the provision, management and safeguarding of water:

“This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women’s specific needs and to equip and empower women to participate at all levels in water resources programmes, including decision-making and implementation, in ways defined by them”.

...a gender-aware water management...

It is widely acknowledged that women play a key role in the collection and safeguarding of water for domestic and very often, agricultural use, in rural Mediterranean communities, but they have much less influential role than men in management and decision-making related to water issues. This has resulted to facility designs and management structures that hamper effective use and management. The role of women (and of men) as decision-makers varies among societies. Socially defined roles and relations of women and men -differentiated by age, social class, ethnic group and religion- determine how water is managed. While there is a general progress in increasing women participation, some societies maintain barriers that must be taken into account in designing management systems. Participatory process must be established so that women and men jointly make decisions on water management issues. Such processes provide for opportunities for women to benefit equitably from the use of water resources and to participate in decision-making. Thus, there is a need to ensure that the water sector as a whole must be gender aware.¹

4. Water has an economic value in all its competing uses and should be recognised as an economic good:

“Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use and of encouraging conservation and protection of water resources”.

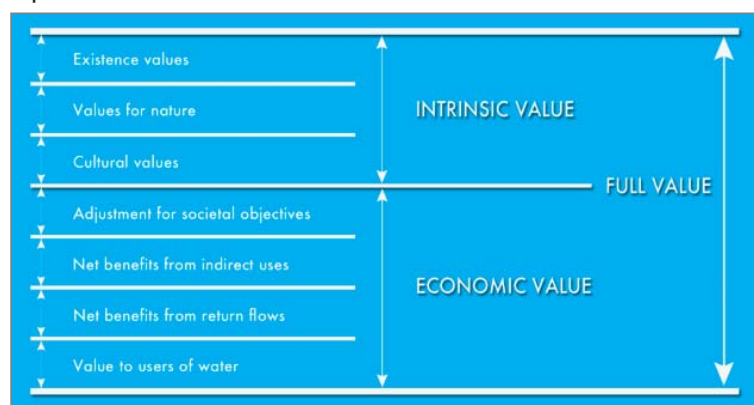
...economic & intrinsic value of water...

It is often said that many past failures in water resources management are attributable to the fact that water was and still is considered as a free good. It is much more correct to say that failures are connected to the fact that the full value of water has not been recognized. However, particularly in the Mediterranean region the non-economic value of water should not be underestimated.

Water, as air, is a public good. However, its use and management requires investments and costs and therefore its value has two components: the *economic* and the *intrinsic* one. The economic value depends on the user and the way the water is used, including value to direct users of water, net benefits from return flows, net benefits from indirect uses and the contribution of water towards the attainment of social goals. The intrinsic value includes non-use values (e.g. existence values, values for nature, cultural values and social values-see the figure below).¹

...full-cost recovery strategies without burdening the poor and vulnerable...

This approach indicates that full cost-recovery refers basically to the economic value and it cannot include all other aspects of its intrinsic value. Nevertheless, “full cost recovery” should be the objective for almost all water uses. In a simplified way full-cost pricing of water recommends that consumers be charged the full cost of providing water services, including collecting, treating, and distributing of water and also, disposing of wastewater. This does not preclude governments from providing targeted and transparent subsidies to the poor and vulnerable, acknowledging the social value of water. Pricing policies must be accompanied by transparent subsidies to low-income communities and individuals allowing them to meet their minimum requirements and also, encouraging user participation in decision-making. Such a pricing approach will encourage infrastructure investments and private sector involvement and provide the revenue to cover the costs of operation and maintenance.¹



6. THE CONCEPT OF INTEGRATION

...managing resources with a holistic way, balancing competing demands in the various sectors...

IWRM looks at the entire hydrological cycle and the interaction of water with the other natural and the socio-economic systems. The same water can serve many different purposes and uses in different places and sectors. The sustainable use of water resources calls for the “overstepping” of the traditional boundaries: they must be viewed in a holistic way, balancing competing demands in the various sectors.¹¹ A systemic and integrated approach for decision making is required which recognises the interdependence of the three main areas: environment, social stability and welfare and economic development and also, acknowledges the interrelationships among the included sectors.

Especially regarding the situation of the water resources in the Mediterranean region, characterized by supply oriented management; resources under pressure and overexploited, partly due to social problems; environmental quality degradation, the need for a holistic management strategy is evident. One of the lessons learned over the years is that the technical solutions alone cannot provide the increasing population of this complex and “peculiar” region with adequate quantities of safe water and sanitation facilities and, in parallel, maintain the integrity of ecosystems. The region needs to integrate the technical, institutional, managerial, social and economic aspects of its water resources implications into an overall management strategy able to bring its water demand in line with its natural renewable water resources.¹²

More specifically, the concept of integration of policies on water management can be explained better when it is seen from two aspects: the *horizontal* aspect (cross sectoral integration) and the *vertical* aspect (sub-sectoral integration).

...compatibility of sectoral objectives with those of sustainable water management...

As far as the **horizontal integration** is concerned (*integrating policies among various sectors*) this involves the coordination and mutual coherence and ideally, compatibility of the objectives among different sectoral policies (in agriculture, industry, domestic sector, ecosystems, etc.). IWRM implies that water issues within all economic and social sectors should be considered in the overall management of water resources. Thus, water policies must be integrated with economic as well as sectoral policies.

A review of compatibility of sectoral goals and objectives with those of sustainable water management is an initial and essential step. The strategies and policies of the various sectors must be assessed for possible impacts on water resources and such assessments must be taken into account when planning and prioritizing developmental projects. In simple words, economic and social policies need to take into account the water resources implications. Consequently, the water resources management system must include cross-sectoral information exchange and co-ordination procedures, as well as techniques for the projects assessments with respect to their implications for the water resources in particular and society in general. Sensitization of and consensus building among key stakeholders on priorities and actions needed towards making integrated sectoral policies is absolutely necessary. However, as most sectoral policies are still centrally driven it should be essential to establish mechanisms and structures of continuous evaluation and review of policies for monitoring, assessment and gradual readjustment of them.

...economic and social implications of water management should be taken into account...

On the other hand, the development and management of water resources have an impact on the economy and society in various ways such as migration, settlement growth, and changes in the composition of industries. It is also, necessary to examine the effects of unsustainable water resources management on sectoral priorities and prospects for the future. Evaluating the costs of ineffective water management (lessons learned, etc.) and the benefits from an integrated approach for all the sectors involved could provide valuable support for further development and implementation of integrated policies.¹

...involvement of all concerned stakeholders...

At the operational level the success of the integrating water planning initiatives depends also on procedural matters and issues related to communication and collaboration among people. The involvement of all concerned stakeholders in planning and management is a key-element in achieving a holistic and balanced management of water. However, proper collaboration among stakeholders does not happen automatically. It requires preparation and good facilitation-coordination. Another perspective is that integration could be sought across geographic levels in terms e.g. of national and regional policies. This includes the building of synergies and partnerships for conflict management and resolution as well as for evaluation of trade-offs between different objectives, plans and actions.

The **vertical integration** of policies refers to a sub-sectoral approach. It suggests a comprehensive consideration and coordination of the different means available (economic and management instruments, legislation/regulation, institutional roles, technology, etc.) belonging to the same sector.

...water cycle: the "integrated model" of nature...

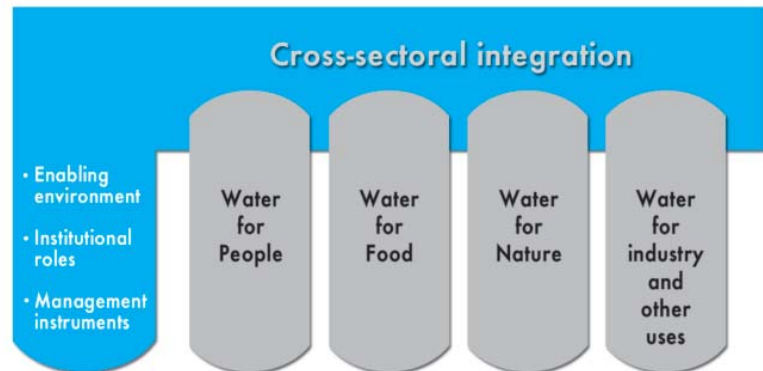
Water cycle is the "integrated water resources model" of nature. A sustainable management practice of water resources must not only take into account but also respect the fragile balance between the components of the water cycle. Rainwater, terrestrial water (lakes, rivers, etc.), coastal and marine water, wetlands: all must be managed in a holistic manner that is based on their particularities and implications, using all the available tools and methods. IWRM looks at the entire hydrological cycle, linking different components of the water resources, such as freshwater & coastal waters, surface & groundwater, upstream & downstream and "green" & "blue" water.¹ In particular, "green" water refers to terrestrial ecosystems whereas "blue" water refers to aquatic ecosystems. It is worth mentioning that most of the water management schemes focus on "blue" water, thus overlooking the difference between rainwater and run-off or evapotranspiration and soil water management. Therefore, the integration of "green" water management has a significant role in the protection of ecosystems.

...IWRM looks at the entire hydrological cycle...

On the other hand, the recognition of freshwater and coastal and marine environments as a management continuum is a basic concept in an IWRM approach. Freshwater systems situation determines the conditions of the coastal zone and this is the case of upstream-downstream management. The implementation of actions to protect upstream areas aims also at the preservation of water quality downstream, thus recognizing the important link between land management and water quality. Land use developments influence the physical distribution and quality of water and must be considered in the overall planning and management of the water resources. The development of river basin action plans (especially for high-priority risks basins) including their rivers, lakes and aquifers is needed in order to integrate land use planning, in upstream regions in particular, with water management and conservation. The cases of *catchment* and *river basin management* can serve as models of IWRM implementation, including the integration of water, land and other natural resources, and also managing issues of water quality-quantity, surface water-groundwater and upstream-downstream water interests.

...actions to protect upstream areas aims also at the preservation of water quality downstream...

The abovementioned key-notes on the vertical and horizontal aspect of integration in water resources management can be displayed on the following figure¹:



...management approaches consistent to the situation of each country/region...

Finally, we should highlight that the management approaches to be practiced should be adapted to each country, region, etc. depending on its physical and environmental characteristics; institutional and administrative systems; economic development and cultural values. Thus, although the concept and principles of integrated water management are common, the strategies and tools may vary widely, even within the Mediterranean region, according to the diverse socio-cultural, economic and environmental conditions of the various countries.

7. APPLYING IWRM: THE TOOLS & METHODS

... a clear political will & a more effective water governance...

The transition in the Mediterranean from a water supply driven phase, where water resources development was the major focus, to an IWRM phase, focusing on water management integrating the social, economic and environmental perspectives would require important transformations. However, IWRM is under way in the region and there are important tools and methods for its implementation, such as the development of River Basin Organisations (RBOs), the incorporation of the stakeholders in decision making, water demand management instruments, reform of laws and policies, etc.; many of these have already been taken, in various degrees in some cases.¹³

It is evident that the prerequisite for preparing and implementing IWRM is a clear political will and the appropriate reform in the governance of water. Achieving a more effective governance of water requires a set of actions, such as those for:

- setting sensible economic *policies*
- preparing clear *legal* frameworks and strong regulations
- ensuring *financial* sustainability
- getting legitimacy and "ownership" by society through *participation of all stakeholders*
- developing adequate *administrative capacity* to manage the resources.

The above actions and their particular roles in implementing integrated water resources management are presented in the following paragraphs.

7.1 WATER POLICY

...an ideal policy & the
"win-win" solutions ...

An *ideal* IWRM policy should exhaust all opportunities to re-arrange the bundles of water endowments among different users to attain "**win-win**" outcomes. In fact, the criterion for measuring the success of an IWRM policy can be that no further re-allocation of water could make any user better off without making someone else worse off including non-human or non-commercial uses, such as natural ecosystems preservation. In other terms, the only re-allocations left are of the "win-lose" type. For instance, a policy of re-cycling wastewater for irrigation could potentially leave both farmers and households better off and allow adequate water for the local wetlands and thus, be a "win-win" policy. However, continuing with this type of policy, at some point, will leave some worse off, regarding the contamination of groundwater or food set in making more recycling a "win-lose" outcome. The ideal IWRM policy, will implement recycling to the point where it still implies a "win-win" outcome and this is a ToolBox case-study of "Using Reclaimed Water in Amman Zarqua Basin" in Jordan (see the following text box)¹¹.

A 25-year draft "Reclaimed Water Utilization Plan" -focused on the Amman-Zarqa Basin- has been prepared to support the implementation of Jordan's **water policies** and in consortium with a Groundwater Management Action Plan for the over-pumped highland's aquifers. Development of the Plan required *open discussion* about acceptable use of reclaimed water and the appropriate standards, *regulations* to safeguard public health and the environment and potential impact on markets for irrigated crops. It also required examination of a wide range of *interrelated options* of water use and management, from industrial applications and replacing groundwater used for irrigation in the highlands, to replacing freshwater currently used in the Jordan valley for irrigation with reclaimed water. The plan also considered requirements such as protecting the public, conserving resources (water, land, vegetation, etc.), complying with international treaties and ensuring environmentally sound practices and included some supporting actions. Supporting actions were: proposals for *on-farm water management*, a *regulatory framework*, *water improvement quality plans*, *monitoring* and *information management* and *crop marketing plans*. Some of the lessons learned were: standards and regulations tailored to specific uses gain wider acceptance than one standard for all uses; searching for the appropriate standards was a good mechanism for initiating public dialogue and awareness; reduction of salt levels in the municipal water supply will benefit irrigated agriculture using reclaimed water and establishes urgency for investing in a new, high-quality, fresh water supply for municipal use.

...dialogue for policy formulation and the role of government ...

Policy making is the first stage of IWRM implementation and at this point the role of government is leading. Devising policy for IWRM is a process of constant refining of a few broad principles to many specific policies. A great challenge is to provide an enabling environment for stakeholders' consultation and **dialogue** in an ongoing manner throughout the policy formulation phase.

...prerequisites for a successful dialogue...

To this end, the government must provide three types of support for a successful dialogue, namely: a structured process for participation of the various stakeholders; tightening the cooperation among the government departments (that may work in isolation from each other) and capacity building for the public to understand what gains are at stake. Finally government should set out a strategic plan to fulfill the abovementioned objectives. Providing a structured opportunity for stakeholders to participate in the dialogue will have multiple benefits. It will add stability and legitimacy to the exercise, give individuals a sense of impact on the public debate and clarify the authority of stakeholders where overlapping of roles and confusion may arise.

...clarifying the authority lines overcomes lack of coordination between government departments...

Lack of clarity in the roles and responsibilities are the most common problems in the Mediterranean countries leading to a break-down of cooperation among government departments as participants in the dialogue. Where the existing legislative and administrative structures have led to confusion as to which agent is the "referee" among the "players", as is often the case between the different Ministries involved in water management, typically those of the Environment, Agriculture, Energy and Development it is likely that departments will work in isolation rather than coordinate. In such cases it will be critical that all affected parties participate in a discussion to rationalize and improve the situation.

...promotion of a common understanding of gains & a strategic plan to achieve them...

The government's role is also to promote a common understanding of **what** is to be gained and **how** it is to be achieved. Spreading an understanding of the gains may involve *education, media campaigns*, as well as selection of *pilot projects* chosen for their capacity to demonstrate IWRM in practice. The strategic policy and common vision on how to achieve gains at practical level may be facilitated by the adoption of a clear focus on priority actions; a *set time-frame*; a *financial policy* and a *long-term commitment* towards IWRM.

...polluter pays...

A clear timeframe and a commitment for the long run are of great value when it comes to billing the reform. A well-documented case comes from outside of the region. The Dutch example of billing the service of waste water treatment on polluters exemplifies the role of cost recovery as a potential tool for IWRM. As a confirmation to the Dutch success story, a recent econometric study estimates that **cost recovery** is a major policy variable that explains the performance of the water policy overall.¹⁴

...pollution levies & other water charges used to finance water improvements...

As the Dutch water levies show, cost recovery can affect the behavior of users by stimulating increased efficiency in the use of water, including cutting down of polluting discharges. The way consumers are charged is calculated by dividing the volume of polluting discharges per inhabitant, which ensures that polluters pay fully for cleaning up. The policy has succeeded in lowering pollution levels remarkably. The success is partly explained by the effect of rising pollution levies -they doubled the period: 1980-1993 on consumers' incentives to conserve water as well as pollute less. At the same time, water charges may be used to improve the quality of infrastructures that supply water. In the case of the Netherlands, pollution levies have been used to finance water treatment stations, which in turn expand the quantity of water available for re-use, and therefore increases the total quantity of water within the country. Similarly, levies could be used to mend old and leaky distribution networks, and realize water savings that in some cases amount to 30% of the total water supplied within urban networks. Moreover, increasing the supply of water would, under market conditions, lower the cost of water to consumers, thereby making cost recovery the shortest way to lower water prices.

Another example of water policy based on tariff measures is the Tool Box case study of "Drinking water supply for the Rabat-Casablanca coastal area" (see the following text-box).¹¹

In the case study of "**drinking water supply for the Rabat-Casablanca coastal area**" a policy issue was undertaken to compress water demand of the area. The policy was based primarily on tariff measures and also, on raising water-saving awareness of users and the involvement of the private sector. Implementing this policy enabled a significant control of the water demand of the area, delaying for more than 20 years the water transfer projects that would have taken place in other case. One of the lessons learned was that adequate tariff structure was the principal measure to encourage water economy.

7.2 WATER LAW

*...domestic water law:
frequently an obstacle to
IWRM...*

Domestic water law has until quite recently been an obstacle to IWRM in many cases, either because rights of use were granted on a first-in-time/first-in-right basis or were tied to land tenure or because in the eyes of law, surface water had no connection to groundwater. However, in recent years, the legal community has made progress both on reconciling outdated and rigid water right formats to the principle of "reasonable and equitable use" and in **viewing the hydrological systems as a whole**, where groundwaters affect surface waters and vice versa.

*...law for water quality &
quantity, against water waste
and commercial abuse of water
rights...*

Apart from shedding light on "who owns what", the Water Law needs to answer the following questions that will guide the implementation of IWRM: *what levels of pollution are acceptable? what protection is afforded? who protects the environment and other "voiceless" users' interests? how is compliance ensured?* In addition to these, in a market oriented system for allocating water use rights, the law needs to address risks of socially unacceptable levels of speculative trade in rights, monopolistic practices, or other market failures. Together these legislative instruments provide the framework that ensures the ongoing implementation of IWRM i.e. rules on monitoring, regulation, compliance and dispute settlement.

Water law continues to evolve towards a more holistic view of watershed management, both in spirit and on the ground. A case in point is the EU Water Framework Directive (WFD), a unique forward-looking plan for integrated water resource management in European Union. WFD seeks to adopt catchment basins as a unit of management, improves the quality of water, adopts full cost recovery and for the first time, includes groundwater to the protected resource base.¹⁵

*...law can be a strong tool only
if stakeholders know, want and
comply with it...*

However, legislative reform including policy and administrative reform, will only work if the stakeholders, local, national and international know, want and comply with the legal provisions. This highlights the point that legal instruments are a strong tool if they are implemented and enforced. Law in the IWRM framework is a strong tool when it represents crystallized broad based political commitment to contribute to the change of social behavior and adopt stricter standards on the use of water.

...an ideal water law for IWRM has a strong conflict resolution potential ...

An ideal legal system for IWRM is above all one which includes a strong mechanism for conflict resolution, in view of the growing tensions between up-stream and down-stream users. IWRM approach and practices are even more needed when we are dealing with shared waters. The wider Mediterranean region counts, among others, three major examples of international water disputes, that of Egypt and Ethiopia over the Blue Nile, the Israel and Palestine over the Jordan River and Turkey's development of the Tigris-Euphrates.

...the principle of no substantial harm, an international binding norm...

There are several domestic water controversies, a recent leading example being that of Spain's National Hydrological Plan, aiming to diverge the flow of the Ebro River 912Km away of its present course, in order to provide water stressed areas in the south of Spain. Another one is the case of Acheloos River diversion from the western part of Greece to the Thessaly plain, in the east. Confronted with the risk of disputes escalating into polarized and highly-charged adversarial claims, international water law has developed a highly successful principle, that of the obligation of "causing no substantial harm" or "reasonable & equitable use of waters".

...allows considering new non-conventional uses of water...

The principle of no substantial harm, which is accepted as an international binding norm by countries, means that parties sharing a common basin have a duty to cooperate in good faith and to engage in consultation over the use of water and refrain from unilateral action which will cause appreciable harm to water endowment of other parties. The advantage of this allocation rule, contained in the UN Watercourses Convention* is its flexibility and adaptability to local and unique interpretations of riparian benefits. It is forward-looking and evolutionary by nature, and allows law to take into account new non-traditional uses of water, such as its use in sustaining healthy ecological communities and the value of "virtual water", as an inter-mediate good in food imports or in developing new forms of land use e.g. the eco-tourism. Critics challenge the vagueness of the standard created by this principle.

*United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, 24 April 1997.

7.3 CATCHMENT MANAGEMENT STRUCTURES

...in search of new administrative units that coincide with the natural hydrographical areas...

Water institutions are undergoing a major shift in order to accommodate an increased demand for environmental quality and sustainable use of the water resource. This shift is revealed in the search for new administrative units that coincide with the natural geographical and hydrological catchment areas and the development of a local or regional approach to integrated water management. Technically there is a widespread agreement that management at the **river basin level** is the most appropriate (river basin organizations-RBOs). Nonetheless, the emerging catchment management structures vary largely from culture to culture and the different environmental, social and political perspectives between countries. However, some common principles underpin the creation of river, lake, aquifer or other administrative structure adjusted to catchment areas and these include:

...common principles...

- Focusing on protecting the aquatic environment as a whole, instead of controlling pollution discharge in particular sources.
- The inclusion of land use policies in water planning on a basin level.
- Taking into account all human activities and water uses within the catchment, instead of those taking place only along the river/lake/coast.
- Allowing the participation of all stakeholders with interests in water management.

The catchment/basin management approach is being followed by various Mediterranean countries, namely: Algeria, Libya, Morocco, Spain, Italy, France, Slovenia, Croatia, Bosnia-Herzegovina, etc.

... catchment structures are country-specific according to different social, economic and environmental perspectives...

- In Spain there are 9 RBOs since the 1920's for the development and allocation of water resources and the control of water use and pollution at basin level, with water user participation in governing bodies and advisory stakeholder participation at national and basin levels.¹³
- In Croatia RBOs have large powers in managing and planning for water resources.¹³

- In France, the Water Act of 1992 gives the local authority and civil society the opportunity to develop a management structure that complements the mandatory broad planning by a regional water planning body, within the wider basin level. The 28 existing local structures, so called "Schemas d'Aménagement des Eaux" (SAGEs), currently initiated, vary in both size of catchment and vocational expertise. The Southern territories of Rhone (Mediterranean-Corse) for instance are typically small size initiatives, dealing with specific issues such as the ecological restitution of single lakes or the provision of irrigation, whereas the Northern SAGE projects (Loire-Bretagne area) cover up to five times larger areas, and are oriented towards broader issues such as drinking water quality.

7.4 CIVIL SOCIETY, COMMUNITY & USERS' PARTICIPATION

...people's water...

Civil society can become a major actor in IWRM if it is organized and empowered adequately. Not only can it enhance IWRM as a force of consensus, but it can also check policies that jeopardize the principles of IWRM, as the case of the Acheloos River in Greece (started in 1992).¹⁶

The Acheloos River diversion project involves the diversion of the river from its physical root to the Thessaly plain in Eastern Greece, including the construction of several dams- mainly for energy generation and irrigation purposes. The campaign to cancel the Acheloos diversion project, which implies serious environmental, social and economic consequences- was initiated by the 4 largest Greek NGOs and was supported by local authorities and lobbied in the EU in a continual and intensive way. In two cases the NGOs have committed the Government to the Council of the State (focusing on the inadequacy of the existing EIAs studies) and in both cases they won. Despite that the Government refused to halt the construction works. A third injunction was submitted against the Government's denial to allow the NGOs access to information related to the river's flow (one of the most important questions of the case) and again the case was won. The campaign is an on-going project including public awareness activities (press-conferences, articles in publications; 320.000 signatures against the diversion have been collected in Greece, Germany and Italy), mobilization, collaboration and coordination among local authorities, NGOs, social sectors and individuals.

...factors for meaningful public participation in IWRM...

However, the capacity of civil society to participate in IWRM meaningfully is proportionate to various parameters, such as: the availability and accuracy of **information** on water issues -including legal tools and principles; the level of public **understanding** of water issues; the **institutional provisions** and procedures in place and the ability of the civil society organizations to voice their opinion.

In order to strengthen public understanding of water issues and its active involvement in water management it is necessary to invest in empowering and developing the potential of the public through capacity building projects, education programmes and awareness-raising campaigns. The importance of capacity building and empowering the public to participate effectively in water resources management is illustrated in the following Tool Box case study of "The role of water users' associations in reforming irrigation" in Egypt.¹¹

The Irrigation Improvement Programme (IIP), one of the large-scale projects in Egypt involves a combination of technical changes and infrastructure investment, together with institutional and organizational changes in the management of water for irrigation. The **Water Users' Associations** play a major role in decision-making and also, in the operation and maintenance of the pumps and other technical facilities, with minimal assistance from the Irrigation Advisory Service. The project also includes the intensive training (seminars and workshops) for water users to engage in the execution of the program. One of the lessons learned was that user's participation is a prerequisite for the effective water management and the increase in the performance of the system; additionally, increasing the capacity of users require intensive training. The Ministry of Water Resources and Irrigation has legalized the formation of water users' associations.

...the imperative need to empower and engage stakeholders, particularly the vulnerable social groups...

The need to empower stakeholders is imperative particularly in the case of vulnerable social groups -poor, women, youth-facing the threat of exclusion from public debate. In this context, civil society and community organizations have an important role in increasing "water literacy" and advocating on behalf of the poor and marginalized; and also in mobilizing local communities to get involved in the management of the local water resources.

In the ToolBox case study of **Community Management of Water Resources in the Imlil Valley** (Morocco), five communities and one local NGO came together to improve availability and regularity of water supply. The project called for elaboration of a water-code drawing the Jmaa'a tradition of community based water organization. Although the case illustrates the importance of setting up clear regulations and building on existing institutions such as Jmaa'a, the mutual aid and the solidarity mechanisms, the gender issues were not dealt with early in the process, because of resistance from the elders and conservative segments of villages.¹¹

7.5 WATER RESOURCES ASSESSMENTS

A water resource assessment adds the quantitative dimension to water resources and uses which are the focus of IWRM. It includes a comprehensive evaluation of water demand and water supply. It also takes on a forecasting role of identifying possible conflicts as well as major risks, such as floods, droughts, accidental pollution, global changes. Finally, it provides a mapping of the hydrological units, with reference to their spatial limits, often involving the use of a Geographical Information System (GIS).

...reliable & regularly updated information...

The water resource assessment is a time-consuming and costly exercise and requires cross-sectoral collaboration while ensuring compatibility of processes, data structure and data quality over large areas. Ideally the assessment will generate reliable and regularly updated information on the hydrological features of water cycle, as well as human uses of water. It will promote the understanding of dose-response relationships between water bodies and polluting substances, defining the appropriate thresholds for preventive and remedial action.

...on sectoral uses of water...

The socio-economic side of the water-assessment tool will record a large array of information on water use, pollution and demand analysis within the appropriate basin unit. The uses of water will cover economic sectors such as agricultural, industrial or household use, as well as the use of water within natural ecosystems.

Data on the ability and willingness of users to pay is essential in order to design an acceptable cost-recovery policy, based on water charges or prices.

...on user's ability and willingness to pay...

Notably, the lack of such data or the inability to turn it into knowledge of the market's demand is one of the major problems for devising a strategy of cost recovery in developing countries.

...on water quality indicators...

Finally, the water resource assessment will compile information on pollution sources, including type of pollution, and magnitude. This, combined with data on the hydrological cycle of basins may be turned into a set of standard water quality indicators that will serve as a tool for monitoring results within basins and between regions.

8. THE GWP TOOLBOX

... an evolving product to assist the implementation of IWRM, putting together a wide range of available tools...

The GWP has developed the: "IWRM ToolBox", a dynamic and evolving product which draws together a wealth of experience and expertise in IWRM in one practical, user-friendly product. Its aim is to support water professionals and policy makers by offering easy access to practical, non-perspective advice, information and guidance on how to establish IWRM. It offers several types of information, such as tools and cases, references and organizations, enabling the users to move between different issues, different geographical areas, different tools and organisations within a structured environment, which supports the cross cutting, holistic approach of IWRM. It is also linked to a number of case studies, as well as some organisations, references and websites. The case studies are also linked to other tools, and the references may be linked with other tools also.

...the categories of the tools...

The tools for IWRM that are set out in ToolBox can be found within the following categories: the enabling environment - including issues related to policies, legislation and financing structures; the institutional roles and the management instruments, such as water resource assessment, water demand management, social change instruments, conflict resolution, regulatory and economic instruments, information management and exchange.

The main purpose of the GWP Toolbox is to help the implementation of IWRM putting together a range of available options-tools. However, the intension is not that these tools should be taken up and used randomly or in isolation. As it has already been emphasized, IWRM stresses the interrelationship of actions of different types working at different levels of influence.

9. MORE GWP PUBLICATIONS ON IWRM

A series of products have been prepared by GWP-Med and its partner-organisations in order to make the principles of IWRM widely known and recognised by all stakeholders in the Mediterranean, assisting in its application. These include:

...the Mediterranean Vision...

- The "Water for the 21st Century: Vision to Action, Mediterranean vision on water, population and the environment" (Vision), coordinated by Blue Plan (MAP/UNEP). This is a synthetic analysis of the present situation regarding water in the region and it explores possible scenarios for water management development till 2010 and 2025, concluding in a sustainable option which is defined as the vision for water in the region.

...the Framework for Action...

- The "Framework for Action for the Mediterranean: Achieving the Vision for the Mediterranean" (FFA), coordinated by the Mediterranean Water Network (MWN) with the contribution from a group of experts. The FFA aims to offer a framework action programme in order to achieve the "sustainable" scenario described in the Mediterranean Vision. Moreover, four sub-regional FFA were prepared on: North of the Mediterranean, Middle East, Mediterranean Islands and North Africa, as well as, four country reports (Egypt, Tunisia, Morocco and Algeria).

...the Core for Action Plan...

- The "Core for Action Plan - Towards an Integrated Water Resources Management in the Mediterranean Region", coordinated by the Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE) with the contributions from a group of experts. This is a synthesis of the most important, until now, action plans and recommendations for water management in the Mediterranean. It aims not to draft yet another action plan, but rather to identify the common core of 15 existing action plans and sets of recommendations where political support is more likely in the region and use these as a solid starting point for successful consensus-based joint initiatives and activities.

CONCLUSIONS

...IWRM is feasible...

The major challenge for the sustainable use and management of water resources in the Mediterranean region is the designing and implementation of IWRM. Although there are still many obstacles in this direction - fragmentation of the institutional framework, supply oriented water management, socio-political constrains, etc. leading to irrational allocations of water- IWRM is not only a guiding principle. Its implementation is feasible and in fact, it is on its way in many countries. Many of its components are already in place.

The institutional and legal framework for IWRM exists in many cases: there are basin authorities and advanced water laws in many Mediterranean countries. Public awareness raising programmes and a tradition of participation of stakeholders also exists (e.g. through water associations) in other parts of the region. However, there is still a lot to be done by continuing the positive experiences and minimizing the problems and obstacles. IWRM will succeed if we manage to obtain a clear political will with comprehensive action where active and meaningful participation and involvement of all stakeholders is secured. In addition, there is great potential and opportunity for the Mediterranean region if IWRM is combined with Integrated Coastal Areas Management (ICAM) resulting to the integrated management of its coastal areas and river basins (ICARM). Such an approach could lead to better coordination of policy making, to actions across sectors and eventually, to a more rational use of the Mediterranean fragile resources, as well as of human resources and means, for the more effective protection of the environment and the sustainable development of the region.

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