



WATERSHED MANAGEMENT CASE STUDY: MEDITERRANEAN

**Watershed management: a key component of rural
development in the Mediterranean region**

By
Luca Fé d'Ostiani

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

All rights reserved. Reproduction and dissemination of material in this information product for educational or other non-commercial purposes are authorized without any prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material in this information product for resale or other commercial purposes is prohibited without written permission of the copyright holders. Applications for such permission should be addressed to the Chief, Publishing Management Service, Information Division, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy or by e-mail to copyright@fao.org

© FAO 2004

Preface

On the occasion of the International Year of Mountains, and in response to the clear consensus reached by the international community regarding the need to ensure harmonious and sustainable development of mountainous areas and watersheds, FAO and its partners in the subject, undertook a large-scale assessment and global review of the current status and future trends of knowledge about and techniques for integrated watershed management.

The objective was to promote the exchange and dissemination of experiences on integrated watershed management techniques, identify constraints to the implementation and development of those techniques during the decade 1990 to 2000 and capture relevant new paradigms and approaches. The lessons learned from diverse experiences are being used to define a new generation of integrated watershed management projects.

Experts from four continents contributed to the assessment, which yielded four main outputs: i) a review of experiences in watershed management, based on questionnaires that were sent to active partners in the field; ii) substantive reports of four regional workshops in Nairobi (Kenya), Kathmandu (Nepal), Arequipa (Peru) and Mègeve (France); iii) four case studies from the Mediterranean basin, Nepal, Bolivia and Burundi; and iv) an international conference in Sassari, Italy.

Watershed management concepts and approaches were reviewed and different experiences assessed. The results of this exercise are presented in several documents, which include the proceedings of workshops and reports on the four case studies.

The conservation, use and sustainable management of watershed resources in order to meet the demands of growing populations have been a high priority for many countries over the past several decades. In this respect, integrated watershed management through people's participation has become widely accepted as the approach that ensures sound sustainable natural resources management and a better economy for upland inhabitants, as well as people living in downstream areas.

Much progress has been achieved in watershed management in the Mediterranean countries, especially during the 1990- 2000 decade, when new approaches and methodologies to promote participatory integrated watershed management were developed and applied. However, for both in the European Community countries of the northern rim and other regions of the Mediterranean basin, much remains still to be done. Further progress is needed, particularly concerning the promotion of a better stock taking and exchange of experiences and lessons learned, as well as the development of a more coherent and integrated approach to negotiated territorial development involving both upstream and downstream areas and their populations.

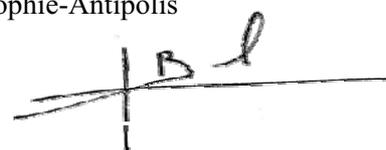
In this regard, the Blue Plan is promoting a number of studies to be utilized in the framework of its *Report on environment and development in the Mediterranean region*, which will be published during 2004.

The present study, funded by the Blue Plan very appropriately ties in with and complements the FAO initiative described above. It was carried out with the logistic and technical assistance of FAO and contributes to no small way to the overall process of promoting knowledge management to achieve positive change in sustainable management of watersheds.

El Hadji Sène
Director Forest Resources Division
FAO, Rome



Guillaume Benoit
Director Blue Plan
Sophie-Antipolis



Acknowledgements

The study was made possible by the continuous and generous technical collaboration and logistic support of the FAO Forest Resources Division and its Forest Conservation, Research and Education Service. It has benefited from the active and creative contribution of Matteo Borzoni, FAO Volunteer, and the positive contributions and review of Alessandra Valentinelli and Salah Rouchiche.

Blue Plan financed this study within the framework of its *Report on environment and development in the Mediterranean region* (to be published during 2004) and with the financial support of the European Union.

Contents

PREFACE	iii
ACKNOWLEDGEMENTS	iv
ACRONYMS	vii
INTRODUCTION	1
Study objectives	1
The watershed management concept	1
1. MEDITERRANEAN WATERSHEDS	4
General features	4
Mediterranean watershed subregions	5
Mediterranean mountain ranges and upper watersheds	7
2. RECENT EXPERIENCES AND ONGOING TRENDS IN WATERSHED MANAGEMENT	11
Approaches and methodological aspects	11
Technical aspects	14
Policies and institutional aspects	17
3. ACHIEVEMENTS, GAPS AND LESSONS LEARNED	24
Approaches and methodological aspects	24
Technical aspects	27
Policies and institutional aspects	30
4. PERSPECTIVES FOR THE FUTURE	33
Approaches and methodological aspects	33
Technical aspects	37
Policies and institutional aspects	38
REFERENCES	44
ANNEXES	
1: Summary of main achievements, gaps and lessons learned and perspectives for WM in the Mediterranean region	45
2: The Blue Plan	47
TABLES	
1. Upstream–downstream flows and exchanges	3
2. Mountain area and population by country and subregion in the Mediterranean region	10

MAPS

1.	The coastal areas and watersheds of Mediterranean countries	5
2.	Mountain areas and the hydrographic system in the Mediterranean region	8
3.	Population densities in Mediterranean mountain areas	9
4.	Mountain areas in Italy by typology	37

BOXES

1.	Watershed, catchment and basin	1
2.	Environmental services	2
3.	Mountain classification systems	7
4.	Large watersheds: linkages between land and water management in Morocco	12
5.	The desertification risk in EC Mediterranean countries	15
6.	Negotiating a reforestation project in Tunisia	16
7.	The challenges of an intersectoral approach	17
8.	A successful experience of WM: the PREM project in Morocco	22
9.	Evolution of WM approaches in Morocco	26
10.	Management plan of natural areas and heritage of the Plateau de la Leysse, Savoy, France	27
11.	The Spanish National Hydrological Plan	28
12.	International cooperation on WM subjects in southern Mediterranean countries	29
13.	The Consulta of Vernotico River Basin: a participatory experience in southern Italy	30
14.	Transboundary cooperation in WM: the case of the Sava river basin	32
15.	The Chambéry Declaration on Forests and Water	34
16.	Socio-economic features of mountain areas in Italy, 2002	36
17.	Italy/UNESCO coordinated action for the protection of environmental and natural/cultural heritage	38
18.	The EC Water Framework Directive (WFD) and WM	40
19.	The debate on EC cohesion policy in mountain areas	41
20.	RED-IFO: a model for analysing and supporting decentralization processes	42

Acronyms

asl	above sea level
BA	Basin Authority
BC	Basin Committee
BP	Blue Plan
CAP	Common Agricultural Policy (EC)
CSO	civil society organization
EC	European Community
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographic Information System
GPS	global positioning system
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
INRM	Italian Institute for Mountain Research (<i>Istituto Italiano per la Ricerca sulla Montagna</i>) now IMONT (<i>Istituto Nazionale per la Montagna</i>)
ISW	International Secretariat for Water
IUFRO	International Union of Forestry Research Organizations
IYM	International Year of Mountains
IYFW	UN International Year of Fresh Water
LER	local elevation range
LFA	Less Favoured Area (EC)
M&E	monitoring and evaluation
MAP	Mediterranean Action Plan
MOU	Memorandum of Understanding
NGO	non-governmental organization
NHP	National Hydrological Plan (Spain)
NRM	natural resource management
O&M	operation and maintenance
OECD	Organisation for Economic Co-operation and Development
OEFM	Observatoire Européen sur les Forêts de Montagnes
PAP	Priority Actions Programme
PNABV	National Watershed Management Plan (Morocco)
PRA	participatory rural appraisal
PREM	<i>Pérennité des Ressources en Eau au Maroc</i> (Morocco)
PUCD	Participatory Upland Conservation and Development (FAO and Italy)

RAC	Regional Activity Centre
RBMP	River Basin Management Plan
SDAGE	Master Plan for Water Resources Planning and Management (<i>Schéma d'aménagement et de gestion des eaux</i> , France)
SMD	sustainable mountain development
SME	small and medium enterprise
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCEM	National Association of Mountain Communities (Italy)
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Cultural and Scientific Organization
USAID	United States Agency for International Development
WCMC	World Conservation Monitoring Centre
WDC	Water Dialogue Consortium
WFD	Water Framework Directive (EC)
WHO	World Health Organization
WWF	World Wide Fund for Nature
WM	watershed management

Introduction

STUDY OBJECTIVES

The broad objectives of this watershed management assessment and perspective study for the Mediterranean region are to promote the dissemination and exchange of information on watershed management (WM) and to provide some basic elements that can be used in the design of new policies and approaches.

The study sets out to raise interest and awareness about WM issues in Mediterranean countries among a broad range of institutions, including: i) Regional Activity Centres (RACs), particularly the Blue Plan Regional Activity Centre (BP/RAC); ii) the United Nations Environment Programme (UNEP); iii) Observatoire Européen sur les Forêts de Montagnes (OEFM) in Chambéry, France; and iv) FAO, with its ongoing activities in WM at various levels.¹

The study's focus is on existing dynamics and perspectives; it concentrates on assessing ongoing trends and developments rather than on analysing past experience. Its main aims are to:

- assess state-of-the-art WM concepts, approaches, techniques and policies in the Mediterranean area;
- identify and evaluate achievements, existing gaps and lessons learned, particularly during the 1990–2000 period;
- analyse present trends and perspectives and provide elements to guide the formulation of more effective WM approaches, strategies and policies.

THE WATERSHED MANAGEMENT CONCEPT

In the 1980s, WM was treated largely as a technical issue, and its socio-economic aspects tended to be neglected or even ignored. Numerous initiatives were hence undermined as a result of people's refusal to accept and adopt technical plans that conflicted with their own diverse interests. Today, far more attention is paid to the socio-economic, environmental, institutional and policy aspects of WM. The following reviews the key concepts involved.

Box 1: Watershed, catchment and basin

Strictly speaking, a watershed is the divide between two areas that are drained by different river systems. However, common usage over the years has resulted in watershed coming to mean not only the divide itself but also the natural drainage area within that boundary.

Catchments and basins are the natural drainage areas within the boundary defined by the watershed divide. From a WM point of view, the terms watershed and catchment are essentially interchangeable. As commonly applied, both are scale-independent (a watershed or catchment area can vary from a few hectares to thousands of square kilometres in area).

The term "basin" (often "river basin") is most often used to describe a region drained by a larger river system, and implies a very large watershed or catchment.

Source: Bank-Netherlands, 2001.

¹ Including the regional workshops held in France, the Syrian Arab Republic, Peru, Nepal and Kenya during 2002 and 2003, and the International Conference on Water and Mountains held in Megève, France in September 2002.

A *watershed* is a topographically delineated area that is drained by a stream system, i.e. the total land area above some point on a stream or river that drains past that point. The watershed is a hydrologic unit that is increasingly recognized as a physical-biological and socio-economic model unit for integrated territorial planning and strategic land-use management at different scales (Brooks, 1993).

Watershed management is the process of guiding and organizing the use of water, land and other resources in a watershed in order to provide desired goods and services without adversely affecting the environment and its natural resource base. This concept is based on the close interrelationships among land use, soil protection and water cycle balance, as well as on upstream–downstream linkages. A WM approach is thus a coordinating framework that focuses on public, community and private sector land and water management activities within a hydrologically defined geographic area. Such a framework is valuable because watersheds provide many important environmental, social and economic services (Bank-Netherlands, 2001).

Box 2: Environmental services

“Environmental services” is a generic term for the positive externalities or off-site benefits that are generated by a particular land use. Typically, there are no markets for environmental services and no compensation is paid for providing them. As a result, land users tend not to take environmental services into account when making land-use decisions.

Environmental services can include:

- hydrologic services, such as water quantity, water quality, and water timing or distribution (especially dry-season and storm flows in streams and rivers);
- biodiversity services, such as the maintenance of ecosystems, species and genetic diversity within species – as well as of the processes that sustain these – in terms of their existence value (e.g. ecotourism) and/or their economic potential (e.g. bio-prospecting);
- carbon sequestration services, which reduce the effects of climate change by removing atmospheric carbon through the establishment of new biomass (e.g. trees), or by avoiding new carbon emissions through the conservation of forests or the provision of non-fossil fuel or renewable sources of energy;
- scenic beauty services, which preserve natural landscapes for human enjoyment through tourism, recreation or aesthetics, or for spiritual/cultural reasons;
- disaster vulnerability reduction services, which reduce vulnerability to extreme events such as storms, fire, high winds and earthquakes (e.g. forests’ role in reducing landslides, gullying and the erosion of stream and river banks).

Source: Bank-Netherlands, 2001.

People are affected positively and/or negatively by the interaction of water and other resources.² In turn, people also have an impact on the nature and severity of such interactions, depending on the way and extent to which they use the resources. *Participatory*³ and *integrated*⁴ WM are therefore essential for ensuring the sustainability of flows and exchanges between upstream and downstream areas within a given territory. While conventional WM focuses mainly on natural resources, participatory and integrated WM considers social, political and cultural factors as important (see Table 1).

² The potential negative effects of WM on certain segments of the local population – usually the powerless or marginal groups – must be taken fully into account.

³ The term “participatory” reflects the idea that such management “should be set up with the participation of the local civil society, including communities, private interests, local government and national line agencies” (FAO, 1998).

⁴ The term “integrated” reflects the fact that “the scheme is to be developed, taking into consideration both natural resources use and conservation and socio-economic development needs, i.e. environmental and human factors”(FAO, 1998).

WM approaches generally include a specific *focus on upper watershed* areas,⁵ where land and water interactions are more dynamic. Upper watershed communities are usually under-serviced, isolated and/or depopulated as well as poor and/or vulnerable. Owing to this combination of factors, rural poverty, food insecurity, inadequate natural resource management (NRM) and natural hazard issues have been and still are closely interlinked in upper watersheds, particularly in developing countries. Depending on altitude, latitude and terrain, these hilly to mountainous environments are highly diversified in terms of livelihood opportunities and causes of vulnerability. Other additional aspects relevant to the upper watershed context include: i) difficulty of access and/or isolation; ii) degree of upstream area integration into national social and cultural life; iii) mountain regions' links to the national economy; and iv) upper watersheds' overall economic performance.

Cultural traditions in mountain regions are often strong and resilient. In many places however traditional *livelihood strategies* are no longer sustainable because of rising demographic pressure, rapid deforestation, soil erosion and loss of soil quality, and conflicts over who controls increasingly scarce resources such as water. Mountain cities offer economic opportunities, but also cause pollution, increased needs for cash and the loss of indigenous highland social fabric, expertise and institutions.

Table 1: Upstream–downstream flows and exchanges

Type of flow/ exchange	→ provides Upstream	Downstream ← provides
Natural resource	Water Sediment Forest and rangeland minerals Biological diversity	Conservation works Legislation
Economic	Upland agricultural, conservation and forestry products Labour force Tourism and recreation Local markets	Lowland agricultural products Capital and job opportunities Manufactured goods National/global markets
Social and cultural	Indigenous expertise Ethnicity	Social services Infrastructure Media National and global culture

Source: FAO, 1998.

Watershed management is both a technical and a social undertaking. From a technical perspective, it involves reducing soil erosion, promoting vegetative cover and managing the water cycle. Socio-economically it involves promoting *negotiation processes among all stakeholders* within a watershed, so as to harmonize the activities of numerous land users who may have multiple, conflicting objectives. Participatory approaches can allow people and communities affected by WM to be involved and to help shape key decisions. The aim is to ensure that environmental objectives are well integrated with local economic, social and cultural goals.

⁵ These are the areas that host most of the remaining forest resources.

1. Mediterranean watersheds

GENERAL FEATURES

For centuries, the livelihoods of Mediterranean people have been strongly influenced by the hills and mountain landscapes that border the coastline and by the watersheds that drain upstream waters. Inner uplands provide a significant share of the natural resource base on which coastal areas and settlements have developed. In fact, most freshwater and forest products still originate from these localities, as does a major proportion of the agricultural and livestock products that supply the Mediterranean coastal towns of Europe, the Near East and North Africa.

However, Mediterranean countries have traditionally paid limited attention to their upper watershed systems and mountain regions. Infrastructures, services and productive investments⁶ have usually been concentrated in lowland and coastal areas, while the socio-economic development of inland communities has received inadequate support.

Since the beginning of the twentieth century, an acute shortage of livelihood and job opportunities has forced mountain people in the northern Mediterranean European Community (EC) countries to migrate to towns and coastal areas (and to other countries), leading to the depopulation of upland areas. A similar process is now taking place in the Maghreb,⁷ the Near East and the Balkans, where demographic changes, market economy options and the rise of new social needs have made traditional mountain livelihood systems unsustainable. A significant share of the people migrating from eastern and southern Mediterranean countries towards the EC come from inland mountain areas.

These population dynamics, in turn, have a significant environmental impact on Mediterranean mountains. In the northern rim countries, depopulation and the crisis of lost traditional land husbandry practices have made way for long-term forest rehabilitation and regeneration processes, which could aggravate the risk of forest fires, landslides and floods in the short term. In the eastern and southern rim countries, increased population pressure has affected local ecosystems' capacity to regenerate water, forests and rangeland resources, increasing the processes of erosion, desertification and the loss of indigenous biodiversity.

Since the 1970s, northern Mediterranean countries have grown increasingly aware of the need to address human livelihood and environmental problems in an integrated manner. Sustainability has become a core concern in identifying new approaches to watershed and mountain development. The objective is to incorporate these development areas into the mainstream of national development in a way that is affordable to the mountain communities as well as to local and national governing bodies. Hence, Italy, Spain, France and Greece have launched new policies aimed at stabilizing mountain populations by offering better and more diversified livelihood opportunities, while protecting mountain environments. Within the framework of national decentralization processes, local administrations are playing an ever more important role in the implementation of policies.

Recently, some southern and eastern Mediterranean countries have also started to reorient their WM/upland conservation and development policies according to indications from: i) the Mediterranean Action Plan; ii) various RACs (including the Blue Plan); iii) Chapter 13 of the United Nations Conference on Environment and Development (UNCED) Agenda 21;⁸ and iv) the conventions to combat desertification and conserve biodiversity. Many new national and local initiatives have benefited from the financial and technical support of European and international agencies and non-governmental organizations (NGOs).

⁶ In the industrial, agro-industry and tourism sectors.

⁷ Countries of North Africa, including Morocco, Algeria, Tunisia and the Libyan Arab Jamahiriya.

⁸ Managing Fragile Ecosystems: Sustainable Mountain Development.

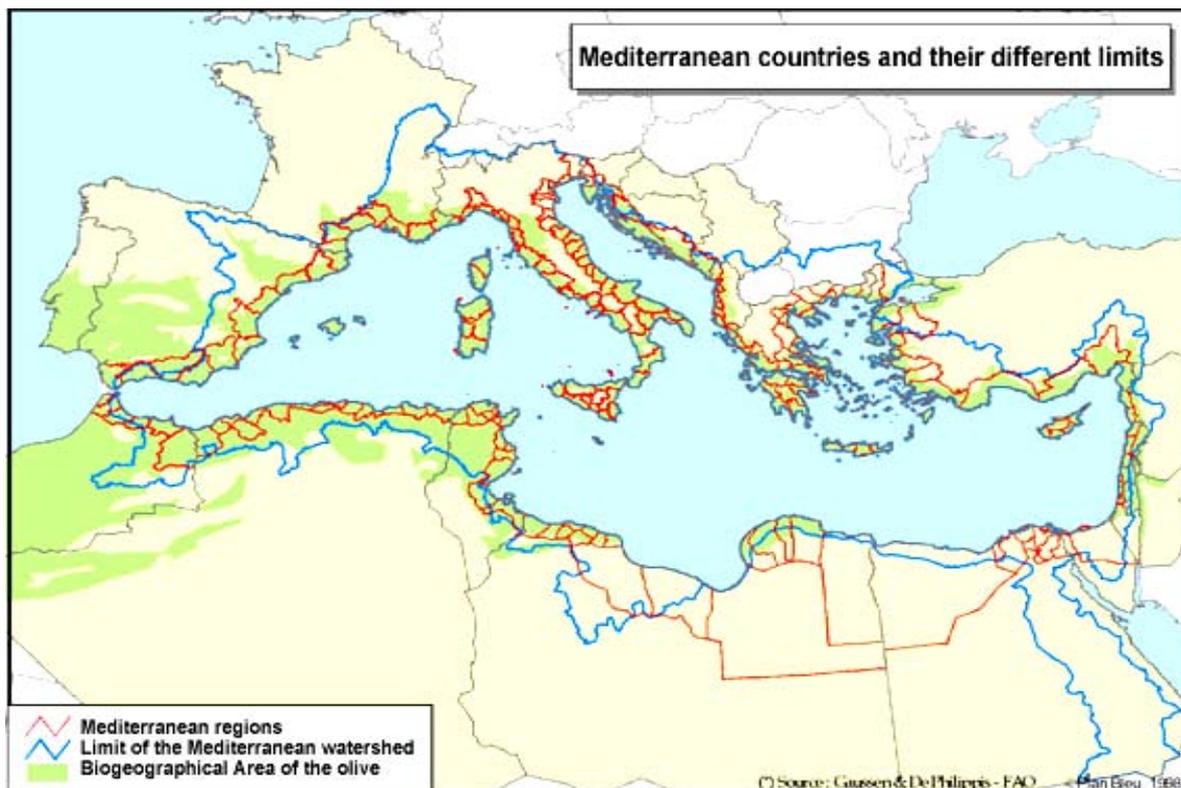
These initiatives show that, while displaying country-specific features, the mountain areas of Mediterranean Europe, North Africa and the Near East share common problems.⁹ They also constitute a clear indication that insufficient attention to WM and sustainable mountain development (SMD) is a major cause of socio-political strain¹⁰ and environmental degradation.¹¹

The United Nations (UN) International Year of Mountains (IYM) 2002, in its attempt to highlight the need for more attention to WM and SMD, provided an excellent opportunity for raising awareness and establishing multistakeholder national committees. There is at present a strong consensus regarding the need to develop, test and validate a comprehensive regional WM and SMD strategy that would enable Mediterranean countries, their local governments and civil society to address these problems in a collaborative and integrated way.

MEDITERRANEAN WATERSHED SUBREGIONS

Mediterranean shorelines run for a total length of about 46 000 km (see Map 1) and cover a little more than 1 million km².¹² The 221 coastal regions around the basin had a population of 145 million people in 2000, representing 34 percent of the total inhabitants of all Mediterranean countries. These regions, and the statistics that apply to them, are commonly utilized to define and analyse the Mediterranean region.

Map 1: The coastal areas and watersheds of Mediterranean countries



When considering Mediterranean watersheds, specific criteria are applied in order to provide a more detailed overview of water resources on the one hand, and of exchanges and interactions between

⁹ Limited livelihood opportunities, unsustainable use of natural resources, lack of investment and infrastructure, marginality from the mainstream of national development, and emigration.

¹⁰ Strain related to internal/international migration, ethnic/civil conflicts and disputes on key natural resources such as water.

¹¹ Decreasing land fertility, desertification and loss of biodiversity.

¹² 12 percent of the total land area of the Mediterranean rim countries.

inland and coastal areas on the other. Mediterranean coastal areas (Map 1) are viewed as coastal strips of land that correspond to nearby catchment basins. Data on watersheds are compared with those on coastal regions, except for when considering major watersheds (Ebro, Rhone and Po), for which data are compared with those for the whole country concerned.¹³

The main characteristics of Mediterranean coastal regions and their watersheds are defined by: i) their great physical diversity; ii) the complexity of their people–nature interactions; and iii) the multiplicity of players involved. In many ways, Mediterranean coastal regions and watersheds reflect the rim countries' problems in terms of the relationships between development and environment, which include limited space, fragile environments and multiple conflicts, both among competitive activities and between these activities and the environment.

Competing activities may be the result of incompatibility in terms of space utilization (urbanization versus agriculture), labour, water and forests. Conflicts involving activities and the environment may result from the pressure exerted by the former on resources and natural habitats through extraction, pollution, disruption of natural processes and destruction. Such activities contribute to more severe landslide and flood events and become particularly serious when they lead to irreversible loss of resources, natural habitats or historical/cultural sites.

Mediterranean watersheds are very diverse in terms of area covered, ranging from small, local catchments to national/international watersheds (Ebro, Po and Rhone) and interregional river systems (Nile).¹⁴ Coastal upland morphologies as defined by UNEP's Priority Actions Programme and RAC (UNEP-PAP/RAC) vary greatly. In contrast to the flat coastal regions of Egypt, the Libyan Arab Jamahiriya and eastern Tunisia, the remaining two-thirds of the Mediterranean coastal area¹⁵ can be classified as hilly or mountainous, with steep slopes, limited and risky areas for agriculture and dense urban settlements, industry and infrastructure.

There are other important differences among watersheds' ecosystems, socio-economic features and policy or institutional frameworks. For instance, the issues facing the water resource-poor countries in the southern and eastern Mediterranean (water access, sharing mechanisms, etc.) are generally different from those facing the relatively water resource-rich countries of the northern side (protection against flooding, landslides and pollution).

However, some significant features and issues are common to several Mediterranean countries, especially at the subregional level, such as among EC member, Balkan, Near East or Maghreb countries. These similarities occur in local ecosystems, common historical and cultural roots and shared socio-economic and institutional features. They are best dealt with at the subregional level, including through the enhanced exchange and networking of experiences, expertise and policy orientation.

This study differentiates between the northern and southern parts of the Mediterranean. It considers two subregions on the northern side (EC members and Balkan countries) and two on the southern part (Near East and North Africa). The countries in each of the subregions are as follows:

1. *EC countries*: Spain, France, Italy and Greece;

¹³ Studies of the last 20 years (UNEP-PAP/RAC with FAO and other institutions) dealing with soil erosion and integrated coastal area and river basin management consider a strip of coastal land 100 km wide as the basic coastal area and expand this to regions that are further inland in the case of major Mediterranean watersheds: "...Coastal uplands are defined as an area of the interior between the shorelands and, most frequently, the highest peak of the closest mountain range.... In practice, all relevant upstream processes and those parts of river basin areas under the influence of the Mediterranean climate and with Mediterranean-specific biota should be considered as corresponding to the Barcelona Convention definition. Faraway areas of large rivers, such as Ebro, Rhone, Po and Nile, are in practice excluded, but not the relevant impact generated there." (See MAP/UNEP-PAP/RAC, 1995).

¹⁴ The study considers only its Mediterranean portion of the Nile river basin.

¹⁵ EC, Maghreb and Balkan countries together with, Lebanon, Israel and Turkey.

2. *Southeastern Europe*: Albania, Bosnia and Herzegovina, Croatia, Serbia and Montenegro, Slovenia, Malta and Cyprus;¹⁶
3. *Near East*: Turkey, the Syrian Arab Republic, Lebanon, Israel and Palestinian Authority;
4. *North Africa*: Egypt, the Libyan Arab Jamahiriya, Tunisia, Algeria and Morocco.

MEDITERRANEAN MOUNTAIN RANGES AND UPPER WATERSHEDS

This study focuses in particular on Mediterranean mountain areas and populations because socio-economic and environmental conditions in mountain ranges and upper watersheds have a strong influence on the management of river basin systems. In the absence of official definitions of what a mountain is for either EC or non-EC countries, the study uses UNEP's World Conservation Monitoring Centre (WCMC) classification system, which designates six mountain area classes based on altitude, slope and the environmental gradients they generate.

Box 3: Mountain classification systems

The criteria used to define each class vary: the lowest mountain area, class 1, refers to altitude and local elevation range (LER) (300 to 1 000 m asl and > 300 m LER); class 2 includes slope as an alternative to LER (1000 to 1 500 m asl, > 300 m LER or > 5° slope); class 3 refers to altitude and slope (1 500 to 2 500 m asl and > 2° slope); and the highest classes 4, 5 and 6 refer to altitude only (2 500 to 3 500 m asl; 3 500 to 4 500 m asl; and > 4 500m asl). Following this approach, a zone with relatively steep slopes or sharp changes in elevation within a small radius (5 km) may be classified as mountainous even at elevations as low as 300 m asl. On the other hand, high plateaus with elevations of less than 2 500 m asl are not classified as mountains, even though they may exhibit many of the characteristics of mountain ecology. Only when elevation exceeds 2 500 m asl is an area always classified as mountainous. UNEP-WCMC has recently added a seventh mountain area class referring to isolated inner basins and plateaus, and has extended the LER radius to 7 km from 5 km, but the significance of these changes has not yet been fully analysed and appreciated (see FAO, 2003; UNEP-WCMC, 2002).

According to this classification, Mediterranean mountains cover some 1.7 million km² (Map 2/Table 2), or about 21 percent of the rim countries' total land area. They host 66 million people, or about 16 percent of these countries' total population (Map 3). In addition, mountains have a direct environmental influence over vast lowland areas where between 60 and 80 percent of the Mediterranean countries' total population lives. This influence relates especially to the quantity, quality and timing of water resources.

At the overall basin level, 53 percent of the mountain area and 70 percent of its population are in the lowest mountain area class 1 (300 to 1 000 m asl); 28 percent of the area and 21 percent of the population are in class 2 (1 000 to 1 500 m asl); 17 percent of the area and 9 percent of the population are in class 3 (1 500 to 2 500 m asl); and only 2 percent of the area and less than 0.5 percent of the population are in classes 4, 5 and 6 (more than 2 500 m asl).

The ratio of mountain area to total land area varies significantly among subregions: from almost 59 percent in the Near East to 54 percent in southeastern Europe and 9 percent in North Africa. At the national level the variation is even wider, ranging from 83 percent in Lebanon and 73 percent in Bosnia-Herzegovina, to about 10 percent in Algeria, Tunisia and the Syrian Arab Republic, and to virtually nil in the Maghreb region.

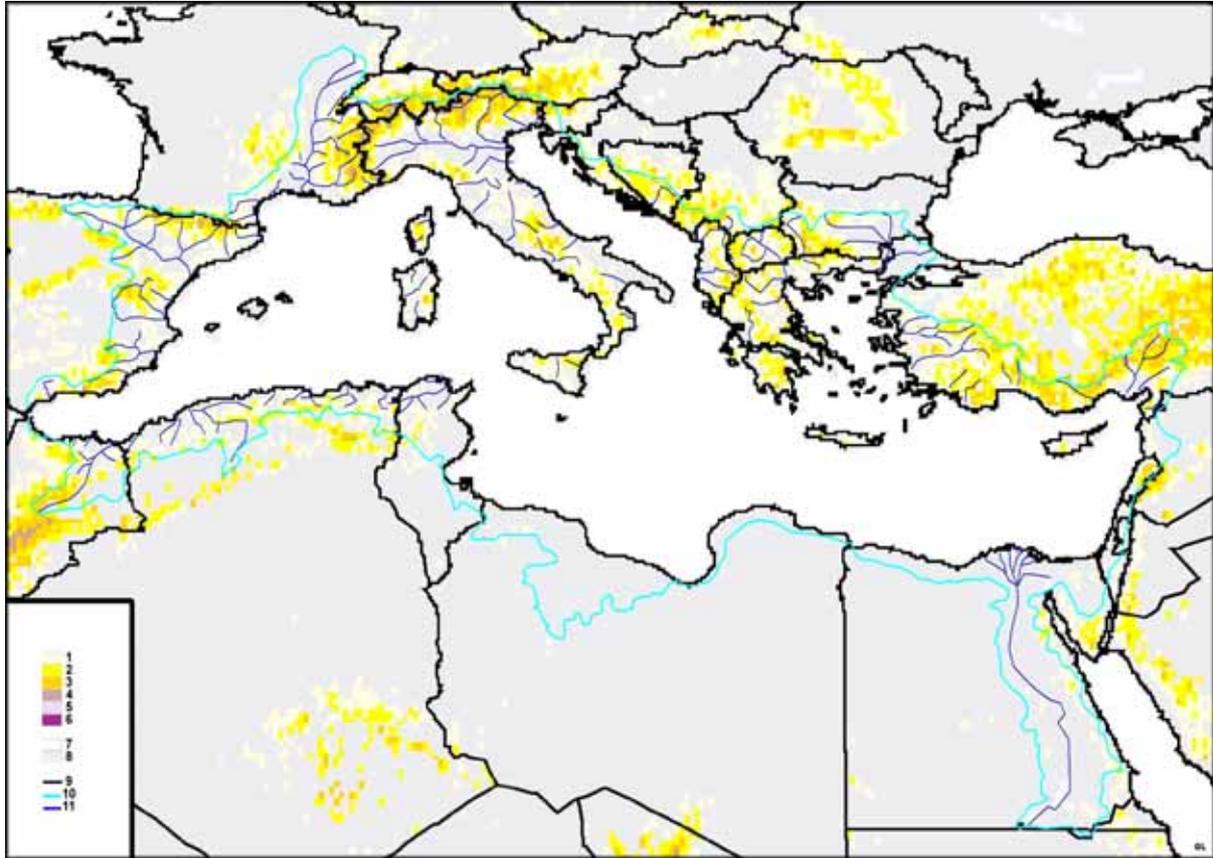
A total of nine out of 19 Mediterranean countries can be classified as very mountainous¹⁷ if small and/or island countries of limited geographical size are excluded.¹⁸ In four of these countries, more

¹⁶ Slovenia, Malta and Cyprus will join the EC during 2004.

¹⁷ That is most of their land area is covered by mountains.

than 30 percent of the population lives in mountain areas. In EC member countries, where mountain areas account for 37 percent of the total land area but only 10 percent of the total population, the situation is very different from that of other Mediterranean countries, where mountain areas account for similar percentages of both total land area and total population.

Map 2: Mountain areas and the hydrographic system in the Mediterranean region

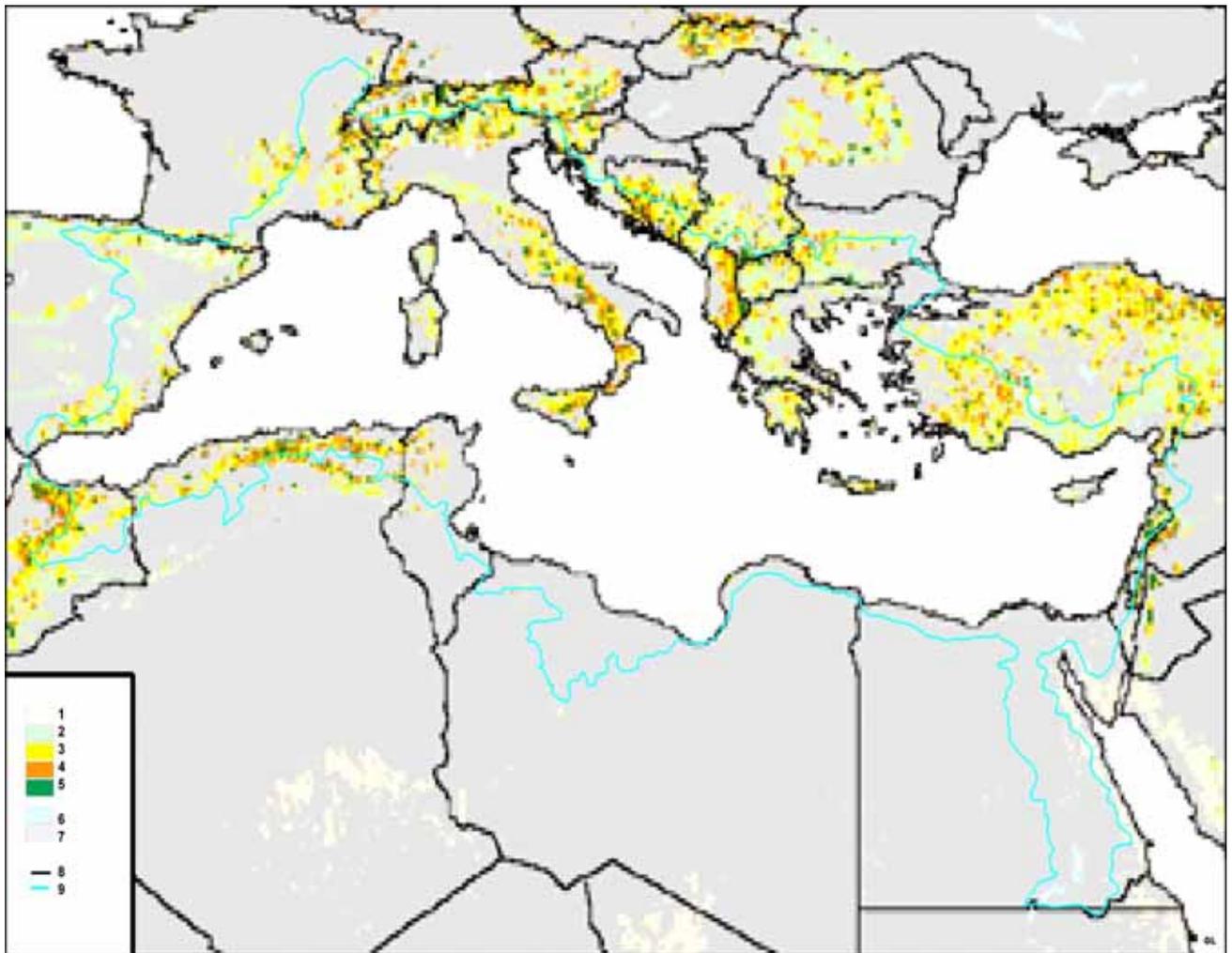


Legend: 1 = 300–1 000 m asl and LER > 300 m; 2 = 1 000–1 500 m asl and slope $\geq 5^\circ$, or LER > 300 m); 3 = 1 500–2 500 m asl and slope 2° ; 4 = 2 500–3 500 m asl; 5 = 3 500–4 500 m asl; 6 = $\geq 4 500$ m asl; 7 = water bodies; 8 = non-mountain areas; 9 = national borders; 10 = limit of the Mediterranean watershed; 11= main rivers.

Source: FAO, 2003.

¹⁸ For which accurate data are missing.

Map 3: Population densities in Mediterranean mountain areas



Legend: 1 = 0–1 people/km²; 2 = 2–15 people/km²; 3 = 16–50 people/km²; 4 = 50–100 people/km²; 5 = ≥ 100 people/km²; 6 = water bodies; 7 = non-mountain areas; 8 = national borders; 9 = limit of the Mediterranean watershed.

Source: FAO, 2003.

Table 2: Mountain area and population by country and subregion in the Mediterranean region

Mediterranean countries by subregion	Mountain area			Mountain population (2000)		
	'000 km ²	As % of total Mediterranean mountain area	As % of total country land area	Million people	As % of total Mediterranean mountain population	As % of total country population
EC	535	31	37	15.9	24	10
France	107	6	20	3.4	5	6
Greece	71	4	58	1.4	2	15
Italy	148	9	50	6.5	10	12
Spain	209	12	42	4.6	7	12
Southeastern Europe	146	9	54	6.7	10	27
Albania	20	1	72	1.3	2	39
Bosnia and Herzegovina	38	2	73	1.9	3	50
Croatia	17	1	31	0.3	0	6
Slovenia	13	1	67	0.4	1	24
Serbia and Montenegro	55	3	54	2.8	4	26
Cyprus	3	..	37	6
North Mediterranean subtotal	681	40	39	22.6	34	12
Near East	578	33	59	27.8	42	32
Israel	4	..	21	1.0	1	18
Lebanon	8	..	83	1.1	2	37
Syria	21	1	11	2.6	4	16
Turkey	545	31	70	23.1	35	37
North Africa	478	27	9	15.4	24	11
Algeria	192	11	8	7.9	12	26
Morocco	188	11	46	6.9	10	24
Tunisia	19	1	12	0.6	1	7
Egypt	60	3	6
Libya	19	1	1	2
South and east Mediterranean subtotal	1 056	60	16	43.2	66	19
TOTAL MEDITERRANEAN	1 737	100	21	65.8	100	16

Note: Data computed by FAO's Geographic Information System (FAO-GIS) Unit (SDRN) using the best available global raster maps. Owing to the low resolution of these maps, area and population in some small and/or island countries could not be calculated with sufficient accuracy. Such countries are therefore not included on the list. Data regarding the total area and population of some countries on the list may differ by about 10 percent from the equivalent data in other international statistical sources.

Source: FAO, 2003.

2. Recent experiences and ongoing trends in watershed management

APPROACHES AND METHODOLOGICAL ASPECTS

General

WM consists in managing water resources through compatible land resource management systems. It is now considered to be the most appropriate approach to ensuring the conservation and sustainability of land-based water resources, in both uplands and lowlands. Since the 1960s, most governments in the Mediterranean region have employed WM principles in their attempts to reverse the increasing degradation of water and soil resources.

Strategies and approaches have evolved over the years, and an integrated territorial approach that includes the participation of all relevant key actors has become a widely accepted method to sustain the management of upland watersheds, and more and more of entire catchment areas. In theory, watershed resource management is more likely to be successful when carried out within physiographic boundaries,¹⁹ when it is easier to identify a coherent set of interventions, as well as implementation and monitoring procedures.

In practice, however, watershed boundaries are usually overlaid by political and administrative borders. As a result, similar, contiguous watersheds can fall within several political and administrative areas, and therefore be subject to a range of diverse land tenure systems and management practices. Especially when large watersheds are concerned, WM approaches are sometimes criticized for failing to harmonize the diverse uses, types of access and ownership, and political and social constraints that are involved.

Another criticism of the WM concept is that it risks considering water as just one of the by-products of territorial planning, while neglecting its centrality and the fundamental need for water management and control. Indeed, WM programmes are sometimes judged to be too closely focused on local development²⁰ and to have too little impact on water resources, other than protecting them. Some studies have demonstrated this by concluding that WM practices would have very limited impact in terms of reduced erosion and sedimentation processes in downstream areas, and that this impact would be difficult to quantify (FAO, 2000a), even in medium-sized watersheds.

In this interpretation, the WM concept is seen as adequate and practicable at the sub-watershed level, but not appropriate for large river basins, where water resource management itself should be a primary objective. One main reason given for this view is that the direct interests of local resource users do not usually extend beyond their immediate watershed territory. Upstream resource users are therefore unlikely to be concerned about preventing and combating degradation processes that take place several kilometres downstream, and vice-versa.

This opinion is challenged by the fact that technical and hydrological considerations come second to political and strategic ones in many national and transboundary catchment areas. As a result, regardless of the diverse opinions held, there is usually general agreement on the need to establish a *policy dialogue* and a *negotiation process* among concerned authorities and stakeholders at the local/provincial as well as the national and international levels. Furthermore, WM environmental and socio-economic issues appear to be playing an increasingly crucial role. For instance, effective water

¹⁹ Usually the catchment area or the watershed divide.

²⁰ For example, improving local livelihood conditions, diversifying household incomes, increasing soil humidity and agricultural productivity/production, and controlling site-specific erosion.

cycle management is being combined with flood risk mitigation at the basin scale, while sustainable rural development, multifunctional forestry and land protection are being promoted as diversified livelihood opportunities for upper watershed communities.

In the 1990s, significant progress was made towards an integrated and realistic collaborative WM approach. This was partly in response to severe flood events in EC Mediterranean countries and to dramatic socio-political and environmental changes in the Balkans and the Near East.

Box 4: Large watersheds: linkages between land and water management in Morocco

A team of national and FAO experts came together in the mid-1990s to formulate a large-scale WM project for Morocco under the technical responsibility of FAO's Forestry Department. It was intended to promote participatory WM, putting local people at the centre of the land management process. The project concerned watershed areas ranging from 1 000 to 50 000 km², and specific sediment yields that varied from 300 to 3 000 tonnes/km²/year, most of it caused by the geology of watersheds.

The team's hydrologists assessed the potential impact of land conservation practices on reservoir sedimentation rates in Morocco's large dams. The main aim of this exercise was to quantify and value the benefits of project interventions, and to include the values of these benefits in the project's overall financial accounting framework. However, the initial study showed that the project's impact on reservoir sedimentation would have been negligible, no matter how large a land area it covered. The following were the main reasons for this.

- Only a fraction of the watersheds would benefit from erosion control measures, so sedimentation could only be reduced partially.
- Because the project's participatory approach focused on improving and reducing erosion on farmers' land, the badlands were not directly included in its activities as they were not a priority interest for upland farmers. However, these are the areas where most sedimentation occurs. In this case, the integrated WM approach would therefore have been less effective because natural erosion is far more severe than human-induced erosion.
- The alarming rate at which sedimentation was (and still is) building up in reservoirs called for solutions that would produce immediate results. However, the size of the priority watersheds involved, and the fact that local people adopt technical changes only gradually over time, meant that the benefits of interventions in upland areas would have been slow to be delivered. The Water Resources Department could not accept such a long-term horizon and had to find other remedial actions.
- The project's use of average annual rates of erosion and sedimentation was basically irrelevant as these processes are not steady and vary from year to year. In addition, most erosion and sedimentation is the result of unforeseeable major events (storms causing landslides, flooding, etc.), on which soil and water conservation activities usually have little or no impact.

As a result of these factors, the project formulation team was unable to quantify or assess the potential impact of the proposed WM activities on reservoir sedimentation. In other words, the team was unable to identify any clear or substantial linkage between land management practices and water resources. However, areas with smaller watersheds and different geological conditions may lend themselves better to this type of approach.

Source: FAO, 2000b.

EC countries

In EC Mediterranean countries, the approach to WM has evolved through the following main steps:

- recognizing the diversity of situations, functions and interests, as well as the fragility, of remote rural areas such as mountains (European Commission, 1996);

- focusing on the conservation/protection of natural resources;²¹
- supporting land-use management and planning in the prevention of landslides and floods;
- involving, progressively, first local populations (as users) and then other stakeholders;²²
- adopting the subsidiarity²³ principle and focusing on the key working concept of territorial cohesion;²⁴
- supporting the process of consultation, negotiation and consensus building among actors at all levels, and recognizing that various actors have different understanding, responsibilities, agreements and obligations;
- introducing integrated WM legislation (2000/60/EC Water Framework Directive [WFD]) progressively, and “decoupling” strategies in rural policies;²⁵
- analysing upstream–downstream resource flows and recognizing and financially evaluating environmental services in the formulation of balancing measures;
- creating basin authorities and new co-management mechanisms for local development (e.g. Italy’s *Patti Territoriali*).

These general principles and the need for a mountain territory approach and policy were confirmed at the European Commission seminar on European Policies and Mountains (October 2002), in the presence of the European Commission President, two Commissaries and the President of the Regional Policies Committee (European Commission, 2002a).

Non-EC countries

In non-EC Mediterranean countries, the WM approach has evolved slightly differently, but the steps involved are increasingly similar to those followed by EC member countries:

- an initial technocratic approach focusing on civil works for soil/forest/water protection and conservation, and based on a site-specific project-by-project system;
- a policy-oriented shift from the productive function of minor hydraulic works and the public control of major strategic water reservoirs and distribution systems towards involving local inhabitants in improved upstream NRM, and withdrawing public technical services from non-strategic upland areas, in parallel with the introduction of public assistance initiatives;
- growing attention to involving local users and promoting a more interdisciplinary approach;
- the beginnings of decentralization and the mobilization of local/national NGOs;
- new concerns for territorial/environmental sustainability;
- progressive harmonization with EC environmental and water-related policies.

Despite their traditional top-down approach towards policies and technical matters, several non-EC countries are experimenting with new formulas involving innovative and decentralized decision-making mechanisms and locally based technical solutions.

In the Balkans, the dissolution of centralized regimes in such countries as Albania, Serbia and Montenegro has left public technicians with a very good technical background, but little or no experience of dealing with multidisciplinary territorial and WM issues. As a result, there is a tendency in these countries to hold on to sectoral technical planning visions and solutions from the old regime,

²¹ Including the establishment of national parks and protected areas.

²² Decentralized administrations, NGOs, civil society organizations (CSOs), private interests.

²³ The subsidiarity principle is intended to ensure that decisions are taken as closely as possible to the citizen and that constant checks are made to ensure that community-level action is justified in the light of national, regional or local possibilities available.

²⁴ This is expressed as “...how to achieve a solidarity of peoples and equitably share the costs and the benefits in a diversity of territories?” and should be understood as “...policies aiming at strengthening relations between areas with marked differences in terms of their economic and social characteristics, rather than taking isolated measures specific to individual types of areas.” (European Commission, 2001).

²⁵ Agenda 2000 Common Agricultural Policy (CAP) Reform.

even though these are less appropriate to the drastically changed political, institutional and socio-economic situation.

Croatia and Slovenia have developed a more integrated approach to WM, even though research and the transfer of technology to local stakeholders are mainly driven by donors, while education and research institutions continue to follow a top-down approach.

TECHNICAL ASPECTS

In recent years, approaches to the technical aspects of WM in the Mediterranean region have evolved along the following two major trends:

- There has been a progressive shift from a technocratic focus on resource conservation to a more integrated one that includes socio-economic, environmental, policy and technical considerations. This trend also promotes the territorial dimension of the basic WM concept; it is common to all Mediterranean countries, although the timing and modalities used vary from country to country.
- The decentralization process, together with the progressive introduction of participatory approaches to natural resource use and conservation, aims at involving local populations and other stakeholders in analysing, identifying needs and priorities for action, and making decisions for improved WM.

Apart from these two common trends, the main technical features, problems and issues of WM vary greatly among countries and subregions of the Mediterranean, and a clear distinction should be made between EC and non-EC contexts.

EC countries

Broadly speaking, there is less focus on technical measures, owing to the sophistication of those developed so far and to the ongoing decentralization and devolution processes, which include granting local and regional responsibility for WM issues. For example, baseline studies, territorial planning and the implementation of WM-related civil works are often the responsibility of local government authorities, such as autonomous provinces and regions in Italy (e.g. Trento and Bolzano), or basin authorities in France. During this process, a wide range of technical options adapted to specific local and institutional set-ups are being acquired, disseminated and shared among EC Mediterranean countries.

These various options evolved when it became clear that conventional technical packages, often directed towards supplying short-term risk mitigation, were inadequate. The spread of interdisciplinary approaches made it possible to devise more comprehensive strategies to meet environmental goals and develop a set of instruments²⁶ to reflect, assess and compare the complex relationships among land use, soil and water in any given territory.²⁷ In most cases, WM technical options reflect the specific scientific and technical traditions of the country concerned, but they also increasingly comply with EC policies, rules and regulations (e.g. EC Water Framework Directive 00/60).

The control of natural hazards is a main issue. A combination of regional-level risk analysis and risk assessment is increasingly used to guide the design of adequate risk management programmes. The development of databases that contain information on and analysis of historical series has made it possible to produce regional surveys that include hazard maps and projected hazard zone maps, as well as requirements for control techniques and integrated risk management. The focus is on finding a method of risk management that would control natural hazards to within an acceptable level of

²⁶ For example, GIS, cartography and global positioning systems (GPS).

²⁷ Whether it be a micro-site, an entire watershed or a large river basin.

calculable risk. Resource and land use are counted as human-induced potential hazards within the framework of natural risk prevention.

The EC is also paying great attention to soil protection, as more than one-third of Mediterranean rim countries lose an average of 15 tonnes of soil per hectare every year (UNEP, 2000; see Box 5). Accordingly, a number of EC measures promote soil protection, including compulsory set-aside provisions in the agriculture sector. Part of Europe's Common Agricultural Policy, these compulsory set-aside provisions require producers to leave idle a set percentage of land.

The new focus on product quality and niche products is helping to conserve traditional crops²⁸ and traditional techniques,²⁹ some of which were falling into disuse. Major costs for reintroducing traditional techniques and products are covered either by assistance programmes for rural development and multifunctional forestry, or by encouraging people through awareness raising exercises to pay for environmental services (e.g. the CAP reform's "cross-compliance principle").

Box 5: The desertification risk in EC Mediterranean countries

According to the World Atlas of Desertification (UNEP, 1992; European Commission, 1994), central and southeast Spain, central and southern Italy, southern France and extensive areas of Greece are among the EC areas that risk desertification. Flood and landslide control is particularly important in these areas, which have high rates of erosion, steep slopes and intense precipitation (European Environment Agency, 2001a and 2001b).

More than 50 percent of Italy's territory is classified as being at high hydrogeological risk. These areas host 34 million inhabitants, or 60 percent of the country's population. More than 15 percent of the territory and 26 percent of the population are at high risk (Italian Ministry of Environment, 2000). Over the last 20 years, floods and landslides have affected more than 70 000 people, and caused at least €11 billion-worth of damage.

Source: European Commission, 2002b.

Non-EC countries

In North Africa and the Near East, the introduction of integrated and participatory WM is proceeding rather slowly. For a long time, the main objective of soil and water conservation interventions was to protect the physical environment and downstream dams from sedimentation, while creating employment in rural areas. This focus is changing, but policy-makers and technicians continue to design and plan medium- to short-term programmes that are basically target-oriented and follow a conventional top-down approach. Until the mid-1990s, water, soil and forest protection and conservation activities were designed and carried out by government field technicians with little or no involvement from local users.

Many countries in the region³⁰ have focused chiefly on improved water harvesting interventions and on recycling used water. The technical packages developed, although they are adequate³¹ and take account of ecosystem variations within the country, offer only limited alternative options in terms of measures available, plant species to use, etc. They are moreover implemented with little flexibility by managers from public bodies using low-paid rural labourers. No provision exists for analysing and evaluating development works by local technicians. There are even fewer measures to assess either the

²⁸ Such as durum wheat.

²⁹ In NRM, agricultural production, processing and conservation.

³⁰ Particularly Egypt, Israel and Jordan.

³¹ Especially those technical packages developed for water harvesting.

final users' utilization/maintenance³² of the works, or their likely impact on environmental degradation and farm/household yields and incomes.

This general trend results mainly from the partial and late involvement of local populations in all project phases. It is also due to inadequate monitoring and evaluation, which make it difficult to learn from past errors and improve future actions. Although the use of modern information systems is improving the integrated planning of scarce water resources, geo-referenced information systems for water and land management are still not widely disseminated in non-EC Mediterranean countries (see Land-Water MED, 1999).

Recently, the rapid changes brought about by privatization (e.g. in Tunisia) have resulted in new roles for qualified public technicians, who are now involved mainly in appointing and monitoring private contractors. However, the government technicians have not received the necessary training for this. As a result, public officers are losing morale and interest in their jobs, and the most competent and dynamic among them are leaving the public sector to join private companies.

The privatization and decentralization processes have also weakened the links between research centres and the field. In addition, there is not enough exchange of information and experiences among the various actors involved in WM programmes at different levels, both within individual countries and at the subregional level.

Box 6: Negotiating a reforestation project in Tunisia

During a 1998 participatory appraisal exercise³³ in the poverty-stricken hilly areas of Zaghouan Governorate in Tunisia, participants from surrounding douars³⁴ expressed serious concerns about restrictions imposed by a new mechanized reforestation project covering the hilltops of Sidi Salem forest (410 ha). Before the project, local communities viewed the public forest as their free grazing area, where they also collected fuelwood and medicinal herbs. Reforestation involved bulldozing and replanting the whole area with Aleppo pine in fenced plots. Traditional uses of forest products were banned until the commercial wood had been sold to outside traders after a nine-year rotation period. Local communities therefore perceived the programme as a threat to their customary rights.

To address the issue, project staff met with local representatives and the Soil Conservation and Forestry Services. The aim was to identify possible measures that would be technically and economically acceptable to the line agencies, while answering local needs. The joint final proposal included the following measures:

- on gentle slopes, replacing Aleppo pine with fast-growing fodder and honey producing tree species so as to reduce the deferred grazing period;
- extending the firebreak network to make the upper forest zone³⁵ accessible to livestock;
- setting aside the steeper sections for Aleppo pine, and covering the rest with fodder species plots.

The agreement also mobilized community participation in project implementation through such initiatives as:

- contracting local interest groups to prepare and maintain plantations;
- establishing pilot plots to test the introduction of local fodder species;
- creating a local forestry association to be responsible for forest management, as required by Tunisian law;
- providing micro-credit for buying improved stoves that consume less fuelwood.

Following discussion and negotiation on cost-sharing and reciprocal obligations, all activities were integrated into the action plans of concerned douars and line agencies, without any increased costs for the project.

Source: FAO, 1997.

³² One of the rare evaluation studies (carried out by UNDP and FAO in Tunisia in 1991) estimated that about 40 percent of the conservation works carried out in previous years, and covering about 4 million ha, were in bad or very bad condition and required further intervention.

³³ Promoted by the FAO/Italy Participatory Upland Conservation and Development (PUCD) project.

³⁴ Social/residential or administrative rural units.

POLICIES AND INSTITUTIONAL ASPECTS

General

WM policies cover complex issues related to, integrated territorial and land-use management and including access to and use and conservation of strategic and increasingly scarce natural resources such as water and soil. They should: i) involve all stakeholders in analysing the present status and trends; ii) include measures that promote both local livelihood conditions and environmental sustainability; and iii) promote a more balanced relationship between human communities and the natural resource base.

In growingly complex and highly structured societies, such as those of the Mediterranean, WM policies must also face the challenges posed by rapid demographic and socio-economic changes in natural environments that are at risk of degradation. The holistic, flexible approach of WM policies contrasts with conventional systems in which different sectors and skills are separated and handled by different ministries and agencies at the local, national and regional levels. The control and management of water resources may, for instance, be the source of severe competition among the following:

- the Ministry of Agriculture, which views water as a key productive resource;
- specialized power agencies (both public and private), for which it is a source of energy;
- the Health Ministry, which monitors the quality of water as a human necessity;
- the Ministry of Environment, for which water is a key component of the watershed territory.

Most of these bodies have their own agendas, priorities, financial systems and political power. Ministries of environment are normally responsible for national/regional parks and protected areas, forests, mountain areas and WM. They are also usually the focal points for strategic international conventions and agendas.³⁶ However, they tend to have fewer financial resources and less political influence than ministries of agriculture, which are generally mandated to control and manage high-potential irrigated areas downstream.

Box 7: The challenges of an intersectoral approach

According to EC legislation on the strategic assessment of plans and programmes (Dir. 01/42/EC introduced by the Agenda 2000 reform on structural funds), dialogue among different technical bodies and different administrative levels is becoming increasingly important. This new focus is the result of a growing awareness of both environmental issues and the ineffectiveness of conventional sectoral policies. Several EC countries have already defined voluntary agreement schemes to satisfy the increasing need for integrated management practices. WFD 00/60/EC on integrated water resources management is expected to promote the establishment and improvement of WM legislation in those countries where it is not yet enforced or is outdated.

Environmental assessment and WM are both based on interdisciplinary approaches, and have already generated several innovative planning concepts. However, the real challenge will face the forthcoming generation of river basin plans, because comprehensive basin assessment requires close collaboration among various technical bodies and institutions. Success depends on: i) harmonizing the goals, tools and regulatory frameworks of these institutions' sectoral policies; and ii) establishing a capacity for feedback and evaluation that will help to identify and design necessary operational improvements.

³⁵ Outside the project area.

³⁶ For example, UN conventions on desertification, biodiversity and climate change; Chapter 13 of UNCED's Agenda 21 on SMD.

EC countries

In EC Mediterranean countries, most watersheds – and certainly all the major ones – are under the mandate of Basin Authorities (BAs), as well as the relevant national technical agencies. These BAs vary in terms of efficiency, regulatory powers and legal and institutional mechanisms for WM.

Spain was the first EC Mediterranean country to set up a BA for a major river (the *Confederación Hidrográfica del Ebro* in 1926) to administer and manage the waters of the entire Ebro river basin. This was followed by a second BA, on the Duero River, later that year. However, it was only in the 1960s that the BA concept fully took off in Spain with the establishment of BAs on the Gaudalquivir, Gaudiana, Jucar, Segura, Tajo and Southern rivers.

The Water Law (*Ley de Agua* 29/1985) and several subsequent decrees related to the public administration of water resources and hydrology planning extended the original functions of BAs to include the following responsibilities:

- formulation, implementation and regular updating of the Basin Plan;
- management of public water resources that are of national and interregional interest, including water supply and water quality control issues;
- design, construction and management of water supply and utilization public works that have been decided at the national level or by local public and private users.

Spain's adoption of EC Directive 2000/60 (*Marco de Aguas*) will be based on these functions.

The Basin Committee (BC) produces the Basin Master Plan, while specific technical commissions coordinate the management of water resources and the construction of dams and other public works. In order to prevent conflicts among water users, an assembly of local public representatives and private stakeholders is involved in the administration of Spanish BAs. Each BA is financially autonomous and responsible for its own budget. Financial resources are provided by the National Water Secretary of the Ministry of Environment and are used to: i) construct and manage public works; ii) plan land use and forest interventions to combat erosion; iii) modernize irrigation networks; iv) protect river environments and landscapes; and v) carry out studies and research.³⁷

BAs are responsible for both surface and groundwater resources and have established detailed accounting systems for: i) water availability; ii) flood risks and drought frequency; iii) dam and reservoir water capacity regulation; and iv) water supply to irrigated areas.³⁸ BAs in Spain also produce statistics on water quality; they control critical river flows to guarantee the volumes necessary for aquatic ecosystems, and carry out medium-term assessments of underground water uses in order to prevent overexploitation. They are in charge of protecting wetlands and sites that have been classified under the EC Birds Conservation Directive (Special Protection Areas, 79/409/EEC), and the Habitats Directive (Special Areas of Conservation 92/43/EEC).

France followed a similar approach to Spain until 1992, when a different implementation system was introduced under the “*Schéma d'aménagement et de gestion des eaux*” [SDAGE] (Master Plan for Water Resources Planning and Management – Law 92/3, January 1992).

The SDAGE system aims to improve the orientation, implementation and coordination of activities in the territorial basin. It is based on the 1964 legislation (Law 64-1245, December 1964), which created the first BCs to ensure an equitable water supply, water quality and water pollution treatment. The

³⁷ For example, the Southern BA has a budget of €4.4 billion for the next 20 years. This is equivalent to €2 000 for every inhabitant of the basin. The budget is subdivided as follows: 31 percent for environmental protection; 28 percent for hydraulic works; 13 percent for the modernization of irrigation networks; and 11 percent for the conservation of water resources.

³⁸ Irrigation consumes 70 percent of the Southern BA's total water supply.

country was divided into six interregional BCs – Adour-Garonne, Artois-Picardie, Loire-Bretagne, Rhône-Méditerranée-Corse, Rhin-Meuse and Seine-Normandie – which involve local stakeholders, elected members and public administrators in the design of basin-wide water policies that cross administrative boundaries.

SDAGEs promote integrated WM by combining water planning functions that were previously handled separately. Their activities include: i) negotiating among stakeholders; ii) monitoring public works and their achievement of planning targets; iii) implementing balanced water management systems in various sectors; iv) elaborating specific legal frameworks that satisfy local community demands; v) providing a legal basis for WM plans; and vi) harmonizing/coordinating authorization procedures.

Reform of both the 1964 and the 1992 laws has been considered recently, in view of new developments in the water market and the increased demand for protecting water supply and quality. In general, the French Government is promoting sectoral integration as part of its drive towards sustainable development. The Territory and Environment Ministries have been combined, and a new legal framework for multipurpose planning and sustainable development was approved in 1999 (*Loi Voynet*, June 1999). In line with the new EC Water Framework Directive 2000/60, future French water law will integrate various planning sectors such as natural and rural development, public transport and energy supply. Priority will be given to flood risk prevention, pollution control and river ecosystem conservation.

Italy: After more than 20 years of parliamentary debate, a new legal framework for soil protection³⁹ was approved in 1989 (Law 183, May 1989). It provides a coordinated framework for WM issues and establishes both national and regional BAs, among which the most important are those of the Po, Adige, Arno, Tiber and Volturno river basins.

BAs are responsible for all of the hydrological units in their areas of competence, regardless of the administrative section wherein these units are located. National BAs and the national government are responsible for basins that cover more than one region, while local BAs and regional authorities are in charge of basins that are entirely located in one region.

BAs are managed by Technical Committees under the authority of Institutional Committees that include representatives from four ministries, concerned regional governments and a Secretary General. National BAs are autonomous authorities that depend on a single relevant ministry (previously the Ministry of Public Works and now the Ministry of Environment). They are in charge of orienting and planning the activities of local administrations.

BAs' functions cover the main features of WM: i) integrated water and soil management; ii) landslide and flood risk prevention; iii) forestry management; iv) water supply control; and v) water and environmental resources conservation. Activities are coordinated within the framework of a common Basin Master Plan. A round table of basin stakeholders (*Consulta di Bacino*) carries out negotiation, consensus building and decision-making procedures. As technical coordinators, BAs provide increased support to local governments; they have achieved some positive outcomes in their implementation of WM.

It took however much time for most BAs to become operational, mainly because of administrative and organizational problems, insufficient financial resources and vague schedules for approving Basin Plans.⁴⁰ Some of these difficulties were partially solved in 1993, when Law 493/1993 granted BAs – especially national ones – the authority to draw up sectoral sub-plans based on the approved Basin Master Plan. This allowed BAs to concentrate their human and economic resources on territorial

³⁹ *Legge Quadro per il riassetto funzionale e la difesa del suolo.*

⁴⁰ For example, the Po River BA estimated that it would need €13 billion to implement its Basin Master Plan, but received only about €1.9 billion between 1989 and 2000. This was equivalent to €120 per inhabitant of the Po river basin.

priority issues. Other national legislation regarding integrated water management includes Law 36/1994 that defines Territorial Operational Units and Decree 152/1999, which sets standards for water quality.⁴¹

The 1998 Sarno Decree (former Decree 180 of June 1998, now Law 267 of August 1998) speeded up the implementation of BA Master Plans. It was promulgated in response to serious losses of human life caused by landslides in Sarno, southern Italy. The Decree also fixed a date for the approval of sectoral risk plans. All national BAs now have: i) plans for flood and slope risks; ii) maps of different risk exposure levels and potential risk intensities; iii) a legal framework for urban and land-use changes within risk areas; and iv) a list of priority activities for WM.

Sectoral risk plans have led to improved coordination among different administrative levels, more accurate identification of risk areas, and refinement of local administrations' urban planning strategies and tools.⁴² This generally positive development is expected to be consolidated by the overall reform of the legal environmental framework now under discussion in Parliament, and by the national-level adoption of EC Directive 2000/60.

Greece: Water resources in Greece were managed at the central level, which focused on granting water supply concessions. The 1987 Water Management Law established Regional Water Committees, which are mainly water suppliers and are in no way correlated to hydrological basin units. These committees have nevertheless improved the coordination among public works programmes, environmental concerns and the protection of vulnerable aquifers.

The OECD, 2000 study considered that Greece still faces many challenges, such as: "... *reconciling water resource supply and demand, reducing effluents to water from municipal and agricultural sources, protecting land and coastal resources, conserving biodiversity and terrestrial and marine ecosystems*". However, the same study also recognized that positive changes were being made rapidly, mainly owing to the Government's efforts to: i) modernize resource management; ii) assist decentralized administrative bodies; iii) improve the national adoption of EC Directives; and iv) strengthen international collaboration and the exchange of experiences.

The site-specific, case-by-case fragmented approach to WM that still prevails in Greece is in part the result of geographic factors. Many major river catchments cross political and administrative boundaries, which explains, why Greece has a history of conflict, as do some of its neighbouring countries. Rural communities have maintained many of their traditional cooperatives. Forty percent of the irrigated areas, consuming 80 percent of the total water supply, are managed as cooperatives with local boards of elected farmers being responsible for local-level water allocation, environmental protection, social development and equity issues.

Greece and Bulgaria's recently established partnership to protect marine coastal areas and wetlands⁴³ provides examples of the outcomes expected from EC Water Framework Directive 2000/60; it could stimulate the implementation of integrated WM activities at the local basin level.

Non-EC countries

Balkans: The ongoing reorientation/reorganization of existing WM policies and institutional frameworks in the region is complicated by the long duration of the previous period of central planning culture and practice. Nonetheless, the region's relative lack of political/administrative structure provides an interesting opportunity to develop innovative visions, new policies and appropriate legal and institutional instruments. In addition, the remnants of centralized approaches

⁴¹ Previously, these had been the responsibility of regional governments.

⁴² Although conflicts have arisen between BAs and local administrations in some areas.

⁴³ In the framework of an EC-funded project INTERREG III.

from the recent past may also facilitate constructive dialogue and agreement among states in the region.

Southwestern Mediterranean countries: Institutional and legal set-ups appear to be rigid and resistant to change, reorganization or rationalization. In *Tunisia*, for instance, both the Ministry of Environment and that of agriculture are active in WM. In *Morocco*, responsibility for WM policies and activities is shared among the Irrigation Office (Ministry of Agriculture), existing BAs and the Electricity Office. In several other countries, the traditional subdivision between forestry activities, which are usually in the public domain,⁴⁴ and those of soil and water conservation, which are usually in the private domain,⁴⁵ has survived.

However, in spite of this general resistance to change, the region's increased involvement in international environmental action plans,⁴⁶ international cooperation programmes and stronger Mediterranean-wide collaboration are resulting in a number of adjustments to administrative and decision-making mechanisms, including enhanced intersectoral coordination and a progressive shift of management responsibilities from central to decentralized authorities.

Long-term national plans usually set quantitative yearly targets that are implemented on a conventional project-by-project basis by each line agency. As part of a progressive process of change, these plans are beginning to take account of the need for both effective collaboration among technical line agencies and coordination between the decentralized and national levels. However, a number of challenges still have to be faced, especially regarding socio-economic issues. So, in such countries as Tunisia, most soil and water conservation works have benefited medium to large landlords possessing enough land to surrender 5 to 10 percent of their arable land to conservation works that they understand, appreciate and obtain at almost no cost at all.⁴⁷

In the meantime, many small farmers in marginal hilly and mountain areas, who lack information, have resisted conservation interventions by delaying schedules⁴⁸ or even destroying conservation works immediately after their completion in order to resume ploughing along the slopes of narrow vertical plots. Participatory processes have not yet solved this type of conflict.

The general dispersion of responsibilities among several agencies also affects WM, and there is no central authority to act as a focal point for WM issues. This hinders collaboration and experience exchange at the national, subregional and regional levels, and becomes particularly serious in the case of conflict-ridden emergency situations that require setting up urgently a negotiation table at which to discuss and mitigate conflicting matters.

The technical aspects of transboundary or interregional water-related issues are usually easier to negotiate than are the policy matters related to water distribution. Powerful and/or upstream countries tend to control water resources by effectively excluding water issues from international discussions,⁴⁹ even though most regional and subregional treaties and conventions include key references to water distribution.⁵⁰

⁴⁴ Often with the Ministry of Environment.

⁴⁵ Often with the Ministry of Agriculture.

⁴⁶ Such as UNCED's Agenda 21.

⁴⁷ The benefits of these interventions sometimes include olive trees or other seedlings to stabilize the retention dikes that are bulldozed along the contour lines.

⁴⁸ For machinery and technicians.

⁴⁹ For instance, Turkey prefers to discuss "transboundary waters" rather than "shared watersheds" with its neighbouring countries. Egypt rejects FAO's approach to statistics, which include data on water production per country.

⁵⁰ For example, the Oslo Treaty among Israel, Jordan, the Palestinian Authority, the Syrian Arab Republic and Lebanon.

Box 8: A successful experience of WM: the PREM project in Morocco

The ongoing Pérennité des Ressources en Eau du Maroc (PREM) project focuses on conserving water resources. Co-funded by the Ministry of Environment (25 percent) and the United States Agency for International Development (USAID), the project started in 1996 with a total budget of US\$16 million. It included several initiatives for water saving, recycling and management, such as:

- waste water treatment and recycling in Agadir Province;
- water resource conservation in the irrigation, urban and industrial sectors;
- experimentation of pollution-prevention systems in Oued Sebou Province.

The PREM project aims to reinforce the Ministry of Environment's capacity to implement its agenda and develop a more effective role in the coordination of sectoral policies. The project also worked on WM in the Oued Nakhla river basin, which was identified as a priority area because of the serious soil erosion that affects the Rif Mountains in northern Morocco. This started with an in-depth analysis of soil erosion factors based on statistical data and participatory local surveys, which identified two types of action for project implementation: direct actions to prevent soil erosion (planting of fruit trees, rehabilitation of irrigation networks, stabilization of soil, etc.); and indirect actions for mitigating human pressures on natural and forest resources and for diversifying local communities' sources of income. Farmers' associations and village committees were established to carry out project activities, which also involve the Environmental Department of the Ministry of Agriculture, local administrations and the Northern Provinces Development Agency. The role of each partner is formally defined in a convention. The Agricultural Directorate of Tetouan District is responsible for carrying out field activities, and four different operational zones have been defined, covering a total area of 500 ha, 20 percent of which is degraded forest ("matorral" or scrub). By the end of 2002, five village committees were coordinating local farmers' activities. More than 70 000 olive trees have been planted on sloping lands, and laurels have been planted in the valleys. Several workshops have been held in order to include local farmers in the dissemination of good technical practices and local women in income-generating activities related to forest wood and non-wood products. Future activities include the sowing of local fodder species in the matorral to improve its biodiversity.

Payments for environmental services

In recent years, in response to water resources' increasingly strategic role, a number of international initiatives for conflict prevention and negotiation have been launched. Among these is the Water Dialogue Consortium (WDC). Established by international institutions for the period up to 2006 and with the aim of promoting dialogue on environment and agriculture, WDC could be useful to the Mediterranean region.

One recurrent discussion topic in such initiatives and in WM-related actions in general, is the introduction of a system of payments for the environmental and hydrological services provided by well-managed upstream areas to downstream populations and institutions. Such services could be paid for either in cash or by other means, such as through providing off-farm employment to decrease pressure on the resource base.⁵¹ It is clearly easier to identify and pay for such services when the public is aware of the issues involved and, more important, when the clients' economic base⁵² is able to generate sufficient financial returns to cover the costs. The landscape and recreational functions of upper watersheds are examples of environmental services that could be paid for. When large numbers of users are involved, local people benefit from incentives and public expenditure for landscape restoration and/or conservation, but must also comply with rules and regulations concerning the habitat, such as the use of traditional materials and architectural requisites.

⁵¹ Among recent studies on the subject, see FAO, 2002.

⁵² Agro-industry, tourism, etc.

Water fees are perhaps the most important source of income for environmental services and can generate significant resources for overall WM. As indicated in a recent European Commission document,⁵³ “the matter of scale is also to be considered. Financial costs are better assessed and managed at water-service distribution level, but in environmental terms, it is that of water catchment area that is the most appropriate. This may cause difficulties in the case of cross-border catchment areas.... In order to ease the transition to incentive pricing, it might be necessary to adapt the existing institutional framework.”

The characteristics and requirements of WM policies for upper watersheds are basically the same as those for mountain areas, which no European-wide policy addresses specifically, despite the growing recognition of these areas' needs.⁵⁴ Upper watersheds continue to be covered by the CAP and its rural development pillar, receiving specific support as Less-Favoured Areas (LFAs). In non-EC Mediterranean countries, upper watershed management is often linked to the objectives of reducing poverty and food insecurity and securing land tenure rights. As a result, technical agencies that traditionally dealt with public conservation works increasingly have to cooperate with social services, public assistance programmes and NGOs.

⁵³ COM (2000)477 (not yet published, Communication from the Commission to the Council, European Parliament and Economic and Social Committee, *Pricing and sustainable management of water resources*) states: “It would be necessary to ensure transparency and the involvement of the public in water pricing policies.... The water pricing policies must be combined with other measures in order to solve the qualitative and quantitative water resource management problems. It must also ensure better synergy between water pricing policy and the other European Union policies...”, July 2000, Brussels.

⁵⁴ The first official high-level seminar on mountain policies was held by the European Commission in October 2002 with the participation of the President of the Commission, two Commissaries and the Secretary of the Regional Affairs Commission.

3. Achievements, gaps and lessons learned

Annex I gives a summary of the achievements, gaps, lessons learned and perspectives for WM in the Mediterranean region. These are described in greater detail in this chapter.

APPROACHES AND METHODOLOGICAL ASPECTS

EC countries

Achievements

- The integrated, participatory WM approach is being adapted and adopted by national and sub-national institutions. It is furthermore supported by complementary EC policies for social and economic cohesion, rural development and decentralization.
- National and Europe-wide institutions and agencies that are active in marine and coastal area management are becoming increasingly interested in the territorial WM concept and approach.

Gaps

- Dense urbanization and industrialization have gravely deteriorated natural landscapes, soils and marine and freshwater coastal areas. Although the recently adopted integrated, territorial approach to WM has already made some progress, the “polluter pays” principle needs to be more widely accepted and applied.
- The continuing economic inequalities between Mediterranean coastal areas⁵⁵ and corresponding uplands may cause inland upper watershed areas to be considered and used mainly as recreational zones for outside users.⁵⁶ This gap also decreases the willingness to pay for the environmental services rendered by upland areas and their inhabitants (the user pays principle).

Lessons learned

- Decentralized administrative bodies and their national-level associations (e.g. the National Associations of Mountain Communities, UNCEM in Italy and ANEM in France) should establish mutually strengthening links with other European associations that share similar problems as LFAs (e.g. the European islands federation, EURISLES). They should also improve the image of upland and mountain areas in national public opinion. Mountain areas and their specific characteristics should not be viewed as a problem but as a national and international resource.
- Existing positive experiences of more equitable upstream–downstream relationships⁵⁷ need to be carefully analysed in order to draw lessons that can be replicated elsewhere.

Non-EC countries

Achievements

- A less top-down, more participatory approach is being introduced into the political principles of most countries.
- Several governments are experimenting with non-site-specific and more coordinated approaches to territorial development, in both rural and urban/peri-urban areas.⁵⁸

⁵⁵ Which have long benefited from political and economic power concentration.

⁵⁶ Without any attempt to establish greater socio-economic equality among territories.

⁵⁷ As in the case of Perrier in France.

⁵⁸ For example, operational coordination among the *Programme de solidarité sociale – 262* and the field programmes of relevant line agencies in Tunisia.

- Some RACs, such as the Priority Action Programme (PAP/RAC)⁵⁹ based in Split, have developed new wider-scale approaches to the management of erosion and desertification control by:
 - identifying common concepts and definitions;
 - designing common analytical tools (i.e. cartography, databases);
 - testing and adapting technical measures for erosion control in pilot areas; and
 - defining priority areas for action and policy orientation.

Several countries (including Algeria, Morocco, Tunisia, Spain and Turkey) have adopted this approach.

Gaps

- Although integrated participatory WM is adequately implemented in pilot experiences, it faces serious difficulties when it comes to integrating it into the working systems of national and decentralized administrations.
- In general, WM activities are planned and implemented in a target-oriented and technical-based way that pays limited attention to social and economic factors.
- In the Balkans, there is a tendency to stick to the sectoral planning visions and solutions of the past, even though these are decreasingly practicable in today's drastically changed political, institutional and socio-economic context.

Lessons learned

- Public administrations' policies and working methods need to be reoriented and their staff trained or retrained before a real shift in WM approaches/practices can be brought about. Governments need to adopt integrated participatory approaches to WM and help mobilize new actors, such as local communities and NGOs.
- In rapidly modernizing countries, the integrated participatory WM approach must first be oriented towards small farmers, especially those in marginal hilly and mountain areas. Small farmers should benefit fully from existing as well as new incentives, while medium-sized and large landowners in the foothills and lowland areas could be requested to contribute to the costs of publicly funded soil and water conservation measures. In this way, rural development policies and approaches would be sufficiently flexible and adaptable to countries' diverse socio-economic situations.
- The integrated participatory approach has already been successfully tested in several pilot projects in the Maghreb and Near East regions. It needs however to be adapted to each local context while taking into account the ongoing depopulation and feminization processes that are taking place in most rural areas. Although women are increasingly managing family farms, they are not considered as household heads and have therefore no access to technical assistance services and credit programmes.
- Pre-project and pre-intervention situations need to be identified for project monitoring and evaluation (M&E), using baseline surveys and participatory rural appraisals (PRAs). M&E systems should be built into projects at the design stage, and indicators should be limited in number and based on discussions and agreement among local populations, NGO staff and decentralized technical officers.⁶⁰
- In Islamic countries, where the religious dimension permeates daily life, religious environmental and social concepts and visions should be considered when designing communication and technical extension messages.

⁵⁹ The PAP/RAC acts as the main body for the design and pilot testing of guidelines for integrated coastal area and river basin management. It addresses problems related to the intense development of infrastructure and industry that is occurring in the Mediterranean basin, and the stressing effects that this has on coastal environments and resources. The proposed approach for erosion and desertification control management includes two phases: Phase I involves a global survey and assessment of river basins' erosion status, by homogeneous zones and including studies, GIS, matrices and cartography; and Phase II involves the identification of specific forms and processes of land degradation (erosion, salinization, compacting, etc.), their dimensions, frequencies and types; risk areas, and present and potential evolutionary trends; and priority actions by zone, with related technical packages.

⁶⁰ Who are often the end users of indicators.

Box 9: Evolution of WM approaches in Morocco

Most of Morocco's national territory suffers various forms of soil erosion, and 25 percent of the total watershed land area is at high risk of erosion. Upstream soil fertility is decreasing rapidly, while downstream reservoirs are losing much of their stocking capacity (65 000 m³/year – i.e. 0.5 percent of their overall stocking capacity – which could supply enough water to irrigate 5 000 to 6 000 ha of land). Operation and maintenance (O&M) costs for various infrastructures⁶¹ are increasing. Drinking-water availability per capita, which was 1 151 m³/year in 1990,⁶² is expected to drop to 689 m³/year by 2025. In the meantime, Morocco has evolved through the following steps:

- 1917–1951: preventive measures for forest resource conservation and the fight against slash-and-burn techniques;
- 1952–1969: special legislation and public action to combat soil erosion through contracts with communities and landholders or within the framework of National Interest Perimeters;
- 1970: reconnaissance study of erosion status, covering water mobilization policies, watersheds that are upstream from major irrigation schemes, and the drafting of a general plan of action;
- 1997: adoption of a National Watershed Management Plan (PNABV) as the strategic framework for integrating small-scale, local-level planning and long-term integrated participatory WM.

Adopting the PNABV is part of a broader process of reforms that started in 1995 with the new legal framework for water resources and WM,⁶³ followed by several decrees focusing on:

- establishing a National Council on Water and Climate (Conseil supérieur de l'eau et du climat), November 1996;
- establishing the Hydraulic Basin Authority of Oum Er-Rbia, November 1996;
- the official decision to update the national water resources inventory, October 1997;
- reviewing master schemes for water resources and their integrated management (*Plans directeurs d'aménagement intégré des ressources en eau*) and for the PNABV, October 1997;
- establishing fixed regulations for the collection of water in dams, October 1997;
- a system of authorizations for the use of public water resources, February 1998;
- new rules and limitations regarding changes to river beds' morphology and the extraction of material, February 1998;
- creating District Water Commissions, February 1998;
- defining water quality standards and carrying out an inventory of water pollution levels, February 1998;
- defining standards for waste water recycling, February 1998;
- delimiting areas for the protection of water aquifers, February 1998.

On the one hand the new PNABV approach involves major costs and a long-term horizon for extension services, training and capacity building, on the other hand it ensures users' ownership of soil and water conservation works and significant improvements in cost/efficiency ratios. As well as a need for a new funding mechanism with extra-budgetary resources, management flexibility and a system for setting priorities,⁶⁴ recent pilot activities have shown that there is a fundamental need for complementary measures/elements such as:

- full official recognition of forest and rangeland user groups, including clear rules related to resource use;
- adjustments to the legal framework to harmonize it with the needs of an iterative participatory approach, including negotiation mechanisms at all levels and incentive measures for local activities;
- priority ranking of conservation works based on the economic evaluation of upstream and downstream costs (by evaluating the gains lost as a consequence of erosion) among other factors;
- complementing the small-scale self-managed activities of user groups with centrally planned major civil works within a framework that integrates strategic planning with decentralized, participatory and long-term implementation.

Source: Omeranai, 2002.

⁶¹ Dams, hydroelectric power stations, water recycling plants, irrigation systems and commercial ports.

⁶² To be compared with 2 826 m³ in Spain, 3 612 m³ in Turkey, and 5 763 m³ in Greece.

⁶³ Dahir 1-95/August 1995.

⁶⁴ Civil works that affect an area of 1.5 M ha in 22 priority watersheds and that will take 20 years to complete at a rate of 75 000 ha/year have been planned.

TECHNICAL ASPECTS

EC countries

Achievements

Previous rigid technical packages have been replaced by a flexible portfolio of techniques and a set of territory analysis instruments.⁶⁵ Historical data series have been generated and these can be used to study and forecast climatic trends and their impacts. Awareness-raising on upstream–downstream linkages has improved and expanded the application of technical measures for NRM.

Box 10: Management plan of natural areas and heritage of the Plateau de la Leysse, Savoy, France

In the mountainous Bauges Natural Regional Park in Savoy, France, traditional systems of exploiting cultural, economic, natural and landscape resources are being abandoned. In response to this, six municipalities have formed a permanent partnership⁶⁶ aimed at “managing the whole area in a sustainable manner, keeping it living and visited and allowing the development of its local economy and heritage” (Syndicat Intercommunal du Plateau de la Leysse, 2000).

The area concerned covers 10 149 ha, 4 653 ha of which are forest (2 090 ha private and 2 563 ha collective), 4 000 ha agricultural land, 115 ha dry prairie and 600 ha abandoned; the rest of the area is covered by water. With the support of the park authorities, local communities and inhabitants are involved in a consultative process to identify the various elements that contribute to quality of life in the area. In addition, a stakeholders’ legal association has been established to formulate an integrated operational plan that specifies sectors, areas, activities, methods and funding mechanisms. As well as carrying out technical interventions, the plan also integrates activities aimed at involving the local population and raising awareness among young people.

The annual cost of implementing the plan is estimated to be €125/ha: €50 for planning and €75 for field management. In addition, an initial investment of €100/ha is required. Compared with most other farm-level land management systems, this cost is relatively low owing to the large land areas involved.

The plan is important because it affects an area that is part of a rapidly depopulating watershed and that is close to the urban settlement of Chambéry (120 000 people), which is classified as at high risk of flooding.

Source: Zingari, 2002.

Gaps

- Monitoring and follow-up evaluations (carried out three to five years after programmes and projects terminate) are inadequate for assessing: i) the continued use of improved NRM techniques at the farm level; and ii) the environmental impacts of those techniques on soil fertility, water quality, deforestation rates, etc. at the sub-watershed/watershed level.
- Environmental concerns need to be more effectively integrated into sectoral policies in order to improve the coordination of integrated WM strategies among different technical bodies.
- Far less information on upland/mountain environments is available than on lowland areas.
- Linkages among universities, research institutes and WM field implementation activities are deficient.

Lessons learned

There are urgent needs for:

- systematic monitoring and follow-up evaluations that can guide policy and decision-making;

⁶⁵ GIS, cartography, remote sensing, etc.

⁶⁶ A co-management syndicate.

- communication methods for disseminating the results of research and field experience among researchers, land managers and users;
- new methods for determining the carrying capacity of mountain watersheds, in order to identify and treat the underlying causes of watershed degradation, and not just its symptoms;
- increased networking and sharing of WM experiences, information and databases.

Box 11: The Spanish National Hydrological Plan

The National Hydrological Plan (NHP) was adopted by the Spanish Parliament in July 2001. It is mainly concerned with the construction and upgrading of large and medium-sized civil works affecting a total of 863 water infrastructures. The NHP's objective is to control water resources by transferring water from fluvial basins that have an excess to basins with a shortage. It is based on a complex programme to transfer 1 050 hectolitres of water a year from the Ebro River to four other basins in eastern Spain. Recipient regions are Catalonia, Valencia, Murcia and Almeria, where most of the country's irrigated agriculture and mass tourism areas are located. The total cost is about €23 billion, one-third of which will be financed by the EC. Although the plan is presented as being of community interest, it is attracting growing criticism and adverse public opinion from Spanish movements, which point out its potential violation of three important European directives: the Water Framework Directive, the Habitat Directive, and the Directive on Wild Avifauna. Furthermore, no strategic environmental impact assessment has been carried out and the cost-benefit analysis of transferring water from the Ebro gives a negative result. The NHP appears to be a programme of water works rather than a water management plan, while CAP-induced decreases in support to farmers raises other issues of concern.

Non-EC countries

Achievements

- Initial experiences in integrated soil and water management techniques have been positive.
- Local users participate in selecting technical measures and implementation methods.
- There is increased awareness of the urgent need to improve water harvesting, conservation and recycling techniques.

Gaps

- Technical packages that are limited (i.e. lack alternative options) and rigid (i.e. do not take sufficient account of the variability of environmental and socio-economic conditions) continue to be used.
- Conventional site-specific techniques are still being utilized, and there is little use of geo-referenced information systems oriented to the overall territory.
- Technical interventions concentrate more on easily accessible land (i.e. large farms in the foothills and lowlands) than on marginal dispersed farms located upstream.
- Little attention is paid to traditional expertise, despite its value and adaptability to changing conditions (e.g. traditional range management techniques in the Near East and North Africa).
- M&E systems are very limited.
- Research and development of salt-resistant species and varieties (both crop and fodder) is inadequate in most arid and semi-arid countries.⁶⁷
- Linkages among research institutes, technical line agencies and land users are weak.

Lessons learned

- State technicians need to be trained in the processes of privatization and decentralization and their impacts on soil and water conservation interventions. They also need to adapt to changing

⁶⁷ With the exception of Israel.

conditions and assume their new tasks as development agents promoting the active involvement of local people.

- Multidisciplinary working teams and relevant rules need to be established at the same time as integrated NRM techniques are officially adopted.
- It is necessary to take into account the need for rapid returns on investments (land, labour and inputs) when selecting cropping techniques for poor upland farms.
- Systematic and recurrent evaluations of programmes and projects facilitate the orientation and design of policies, planning systems, programmes and projects.
- Technicians are often suspicious about M&E exercises, which they consider to be time-consuming and regard as a means of checking on them. To avoid this, the information required for M&E should be kept to a minimum and ought to be formulated jointly by managers, technicians and households.
- Sharing experiences and techniques at the local, national and subregional levels helps improve professional skills, attitudes and working methods.

Box 12: International cooperation on WM subjects in southern Mediterranean countries

Cooperation on improved water management planning and research is useful for better orientation of WM pilot projects in southern Mediterranean countries, as shown in the following participatory projects.

The International Development Centre (IDRC)⁶⁸ helps developing countries find long-term solutions to the social, economic and environmental problems that they face. It supports academic studies, offers opportunities for hands-on experience and helps southern countries to attain a critical mass of trained and experienced researchers to promote sustainable, equitable development. Its North Africa office (Cairo) has a long history of cooperation with the University of Alexandria. All activities are implemented in collaboration with local universities, research centres or public administration technical bodies.

In North Africa, IDRC promotes participatory water and WM initiatives that valorize indigenous knowledge as a way of assisting local communities to confront land degradation and mitigate environmental impacts. Land evaluation, watershed planning and the management and analysis of farming systems are often integrated into its projects. In 1997, it held a workshop on indigenous water management techniques, coordinated by the International Secretariat for Water (ISW). Local innovators and experts were invited to an open discussion and the results were disseminated through participatory meetings with local communities, farmers and experts. The workshop launched a pilot project in Egypt whose findings suggested that: local users' networks should be established and supported; local communities' resource planning capabilities should be reinforced; and national legal frameworks for technical implementation, sectoral integration and coordination should be harmonized with local users' networks.

IFAD is working with the Algerian Ministry of Agriculture⁶⁹ to develop a pilot project⁷⁰ on the Development of Mountain Agriculture in the Watershed Basin of Oued Saf. The project focuses on participatory planning and capacity building for grassroots organizations and local administrative bodies. Its objective is to formulate local development plans that involve local organizations in the decision-making process and subsequent implementation and analysis phases. A main lesson learned is that participation should involve the entire farming community so that: i) sustainable agricultural technologies are extended over a significant portion of the sub-watershed; ii) local leaders play a strong role as group managers in their community; and iii) local institutions and grassroots organizations are strengthened and assume the responsibility for operating and maintaining project-funded investments.

⁶⁸ IDRC is a public corporation created in 1970 and based in Ottawa, Canada. It has regional offices. Its projects are sometimes co-funded by UNDP, the World Bank or the World Health Organization (WHO).

⁶⁹ Responsible for WM, the valorisation of water resources and the prevention of soil erosion.

⁷⁰ Started in 2001.

POLICIES AND INSTITUTIONAL ASPECTS

EC countries

Achievements

- BAs and related negotiation/co-management mechanisms⁷¹ play a steadily increasing role in coordinating the activities and interventions of national and decentralized agencies and institutions.
- The recent EC Water Framework Directive integrates different thematic and sectoral elements and provides a broader vision of the territory that goes beyond the issues related to water pollution. The directive is supported by EC policies for social and economic cohesion, rural development and decentralization.

Box 13: The Consulta of Vernotico River Basin: a participatory experience in southern Italy

The Consulta of Vernotico River Basin was set up as part of the Land Use as Land Protection pilot exercise⁷² in watershed partnerships. The process aimed at establishing a panel involving local administrative bodies, environmental associations, the rural union Confederazione Italiana Agricoltori, the Ministry of Cultural Resources, the Sarno Basin Authority and INRM research staff.

The inland portion of the Sarno river basin that is close to the Vesuvius volcano – the “Vernotico” area – is severely affected by the mudflows that are typical of volcanic soils. The area, once famous for its high-quality hazelnut and chestnut woods, has at present very limited biodiversity, vegetation cover and soil protection capacity. Furthermore, mechanized hazelnut harvesting systems and frequent fires are increasing the risks of erosion and landslides. Only on the abandoned upper slopes is a spontaneous process of natural forest rehabilitation taking place.

The project’s aim was to assess local administrators and stakeholders’ levels of interest, and evaluate the potential for protective land-use techniques.⁷³ The Consulta identified sustainable development, landscape conservation, land protection and environment qualification as the main topics for the participatory consultation process. All stakeholders agreed on environmental goals (innovative forestry practices, consolidating income through new niche markets, promoting tourism, etc.). However, the activities undertaken at the local level have had mixed results.

Gaps: Based on voluntary participation, the Consulta soon faced organizational difficulties: the rural union and the environmental associations had conflicting views about traditional forestry; and local administrators rapidly lost interest when they realized that the Consulta could not mobilize external funds.

Lessons learned:

- Mountain administrators and communities tend to overlook the links among water, soil and NRM.
- Participatory processes, even when not completely successful, help raise awareness about the crucial role of integrated WM strategies in marginal areas.
- Local administrators need training and capacity building on integrated WM.
- In order to comply with the EC subsidiarity principle, national and regional rural development plans should pay closer attention to mountainous rural and forest areas, and should carefully analyse depopulation processes and the reasons and opportunities for permanent set-aside processes.

Source: INRM, 2002.

⁷¹ Such as the *Consulta di Bacino* and the *Patti Territoriali* in Italy, and the *Charte du Territoire* in France.

⁷² Funded by the Italian Institute for Mountain Research (*Istituto Italiano per la Ricerca sulla Montagna* [INRM]), recently renamed IMONT (*Istituto Nazionale per la Montagna*).

⁷³ For example, the capacity of vegetation cover to mitigate landslide risks; the role of rural land management in soil protection; and the economic and social feasibility of replacing traditional forestry with multifunctional practices.

Gaps

- Experiences related to upstream–downstream linkages, compensation schemes for environmental services and reinvestment mechanisms have not been adequately analysed and shared among countries and agencies in the Mediterranean basin and similar contexts.

Lessons learned

- The water sector must become progressively self-sufficient through the introduction of payments from users and polluters.⁷⁴ However, in order to generate adequate resources for improved WM (through taxes and fines, for instance), users and polluters must have sufficient income to be able to pay (as is the case for industrial and tourism activities, for example). When water users or polluters have limited financial resources or are scattered over the watershed territory (small farmers), it is difficult to collect payments.
- Upstream/mountain areas play an essential role in WM. They therefore require policies that are appropriate to their particular physical and socio-economic conditions. Existing legal and policy instruments, such as the EC PAC, are not specific enough to deal with the diversity and complexity of mountain/upland areas. In addition, there is no EC-wide official definition of mountains and, as a result, mountain-specific data and information are also lacking.
- Upstream/mountain areas are usually very diverse; they include a wide range of income levels and services. Upland/mountain policies should also be differentiated to provide subsidies, incentives and disincentives according to each area's level and type of socio-economic development.
- Despite having among the highest levels of biodiversity in the world, the Mediterranean region, which has a long history of being densely populated, now has only 5 percent of its natural landscape. However, this contains an extremely rich and diversified range of cultural landscapes; for example, natural parks and protected areas cover 42 000 km² within the common framework of the EC Natura 2000 network. In recent years, tourism within the Mediterranean basin has expanded from the traditional coastal areas and beaches towards inland and upland cultural and natural areas. This new trend towards cultural, rural and ecotourism can be optimized in ways that favour the sustainable social and economic development of upland areas.

Non-EC countries

Achievements

Despite the severe civil conflicts that recently affected most countries in the Balkan region, negotiation processes and new coordination agreements are being established and supported by international external assistance and conflict mitigation programmes. Advanced examples of this are the Danube basin and the very recent Framework Agreement for the Sava river Basin.

Gaps

- The political and administrative reorganization process that is under way in the Balkans, combined with the rather slow process of change in most Near Eastern and North African institutions, have made it impossible to identify national focal point institutions/agencies to deal with international WM and water resource issues in non-EC Mediterranean countries.

Lessons learned

- Most non-EC Mediterranean countries are undergoing rapid transformation and modernization, but take little notice of marginal hilly and upland areas. These countries urgently need WM policies that take account of the great variety of ecosystems and the increasing depopulation and feminization of rural areas.
- Local-level payments for environmental services (through taxes, for instance) are feasible only when service users and/or polluters can afford to pay; poverty-stricken upland areas will continue to require outside public or other funding through subsidies and incentive measures.

⁷⁴ "Water must pay for itself".

- In view of the progressive mobilization of stakeholders around common WM-related issues and upstream–downstream linkages, promoting a successful dialogue both within and among countries requires:
 - a real political will to start/support the dialogue process;
 - interventions at appropriate scales, depending on local environmental and institutional homogeneity and/or diversity;⁷⁵
 - respect for local decision-making and power structures, and use of culturally acceptable participatory methods;⁷⁶
 - the involvement of marginal groups (i.e. women, young people, ethnic minorities, etc.), showing consideration for their cultural and traditional backgrounds;
 - equitable power distribution among stakeholders;⁷⁷
 - the existence of local political/institutional systems that are capable of responding to and satisfying the needs identified during participatory consultation;
 - dialogue that focuses on environment and water, and avoids diffuse approaches;
 - sufficient resources for long-term processes (training, facilitation, specialized technical assistance, etc.).

Box 14: Transboundary cooperation in WM: the case of the Sava river basin

In December 2002, a Framework Agreement was signed by the foreign ministers of the four riparian countries of the Sava river basin.⁷⁸ The newly established Sava River Commission is responsible for preparing an integrated management plan for the transboundary Sava River Basin and for coordinating activities such as navigation, sustainable water management, hydro-electricity and environmental protection. In several areas, the Commission will be empowered to issue rules, particularly to ensure safe navigation.

The Framework Agreement includes the four countries' commitment to cooperate in managing the Sava river basin, and establishes a process for achieving the following objectives: 1) establishing an international navigation regime (a protocol) on the Sava river and its main tributaries, in accordance with the international regime of the Danube Commission; 2) promoting sustainable management of the Sava basin waters and related resources; 3) fostering integrated economic development while preserving the Sava basin's environment and the well-being of its people; and 4) establishing the institutional framework to fulfil these objectives.

Priority needs and projects to meet these objectives include: rehabilitation of critical infrastructure to foster economic development; projects to improve water quality management; establishment of a joint warning system for flood control and emergency response; and measures to reopen the Sava river to commercial navigation.

Source: Sava River Basin Commission, 2002.

⁷⁵ Generally, in large watersheds, upstream–downstream linkages become too diffuse (including in terms of time) to stimulate effective consultation and negotiation processes. In addition, most erosion is caused by extreme events (heavy storms, flooding, etc.), the effects of which are difficult to measure and manifest themselves in a long-term time frame.

⁷⁶ Which include transparency and the open discussion of negative elements, weaknesses, limitations, etc.

⁷⁷ Avoiding situations of high power concentration, where dialogue can become undemocratic.

⁷⁸ Bosnia-Herzegovina, Croatia, the Federal Republic of Yugoslavia and Slovenia.

4. Perspectives for the future

While Chapter 2 outlined the ongoing trends in WM, this chapter focuses on the medium and long-term trends and perspectives.

APPROACHES AND METHODOLOGICAL ASPECTS

Top-down versus the grassroots approach

The top-down approach that prevailed in the 1970s and 1980s gradually gave way to a grassroots bottom-up approach in the 1990s. Today, it appears that neither of these approaches alone offers the formula for success. The correct, sustainable approach appears to be somewhere in between. It includes taking account of the biophysical, social, cultural, financial and political considerations of all the concerned stakeholders.

Compared with the present focus on NRM activities, which are often localized and confined to the sub-watershed level, recent trends indicate that future WM initiatives will put more emphasis on: i) the quantity, quality, access and use of water resources; and ii) the overall impact of WM activities at the river sub-basin/basin level. In addition, it is now recognized that in order to involve local users effectively and sustainably in improved NRM and WM, especially in poor upland areas, they need to achieve short-term economic returns on their investments in productive activities and on the environmental services that they provide. This requires setting up adequate incentives for local users, and making provisions for payments for environmental/hydrological services.

Owing to the complex changes involved in new WM approaches, there is a need for government organizations, donors and other stakeholders to reach consensus regarding long-term vision, commitment and financial engagement. Long-term action also requires a substantial reorientation of existing policies and regulations, at both the national and international levels.

WM approaches and policies

WM approaches and policies are likely to undergo important processes of adaptation to variable ecosystem, socio-economic and political conditions that exist among and within Mediterranean countries and subregions. These processes will have to take account of diverse:

- technical approaches and institutional set-ups;
- country strategic priorities;⁷⁹
- paces of change and adaptation of national and decentralized policies and operations;
- visions, interests and priorities between upland and lowland populations;
- visions, interests and priorities between rich and marginal uplands within the same country or subregion.

A more articulated understanding of the issues and opportunities in different geographical areas, both within and among countries, is likely to alter not only WM but also rural development approaches and policies. This process is already under way in EC Mediterranean countries,⁸⁰ while in non-EC countries relevant lessons from recent and ongoing pilot experiences in WM are still being evaluated prior to being integrated into national policies and related approaches. WM programmes and projects

⁷⁹ As water harvesting/stocking in southern and eastern Mediterranean countries, and water/flood control in northern ones.

⁸⁰ For example, the “decoupling” principle included in the very recent reform of EC/PAC (para. 3.4).

ought to be designed on the basis of past as well as recent experiences, including negative ones, as these can provide useful clues for the future.⁸¹

Box 15: The Chambéry Declaration on Forests and Water

Issues regarding mountains, forest cover and water resources are closely linked in WM, as reflected in the liaison between activities for the 2002 International Year of Mountains and those for the 2003 International Year of Fresh Water.

The Workshop on Forests and Water held in Chambéry, France in June 2003 brought together foresters, hydrologists, researchers, planners and policy-makers to discuss ongoing activities aimed at promoting integrated forest and water resources management. Participants adopted the Chambéry Declaration, which includes the main outcomes of all recent events related to integrated WM. It states that:

- Supplies of freshwater are unevenly distributed and increasingly in demand.
- Sustainable forest management is key to water resources management in particular and to upland resources development in general. It is closely linked to watershed development.
- Forested catchments supply water for domestic, agricultural, industrial and other needs in downstream areas.
- Forests and forested watersheds play essential roles in sustaining and protecting water supplies.
- Well-managed forests have a direct impact on the quality of water yields from watersheds and on the regulation of flows. They also mitigate the effects of soil mass movements, rock falls and avalanches, and contribute to soil erosion control and, consequently, to reducing downstream sediment transfers.
- All these forest services related to water may be better identified within a watershed framework, linking upstream and downstream areas.
- Although forest and water resources are inextricably linked, they are rarely managed in an integrated way.

The Declaration also recognizes that: "... a growing number of factors influence forest and water resources, including: climatic variability, local or larger-scale pollution and fires, deforestation and changes in land use, demographic trends, conflicts, market and short-term economic factors, the development of infrastructure and tourism, insufficient participation of local actors, lack of political vision, and shifts in societal expectations." As a conclusion, it states that: "... continuous and determined efforts are needed to integrate the management of these vital resources for sustainable development".

Workshop participants formulated general recommendations, including the following:

- The watershed perspective often implies the need to overcome administrative and political divisions and compartmentalization, and is therefore the best way of achieving the required integration of key resources.
- Participatory and cross-sectoral mechanisms and the exchange of experience are needed in order to promote beneficial interactions among stakeholders.
- The full value of the water-related services derived from forest owners' (private, public, municipal and local communities) management of forests should be clearly recognized.
- There is an urgent need to develop and implement national and sub-national policies, strategies and programmes for the integrated management of forests and water resources.
- Financial, technical and educational solidarity among countries in the area of forests and water resources management should be developed.

Source: Chambéry Declaration on Forests and Water, International Workshop on Forests and Water, Chambéry, France, 5 to 6 June 2003.

⁸¹ Such as the Shiga Declaration (Japan, November 2002), the Final Resolution of FAO's European Forestry Commission Working Party on Management of Mountain Watersheds (Switzerland, September 2002), the Third World Water Forum (Kyoto, Japan, March 2003); the International Union of Forestry Research Organizations (IUFRO) Task Force on Forests in Sustainable Mountain Development; and recent activities of the United Nations Educational, Cultural and Scientific Organization (UNESCO) International Hydrological Programme.

Coordination and decision-making

The 2002 IYM and the initial declarations of the 2003 International Year of Fresh Water (IYFW) stressed the need for: i) improving coordination among projects and programmes in upland and lowland areas; and ii) developing a new mix of mountain-specific policies at the central and decentralized levels. IYM and IYW not only draw attention to existing conflicts over water use, flood risks and landscape rehabilitation, but also contribute to the shift from a negative focus on mountains' constraints and bottlenecks, to an emphasis on their potential and opportunities. The design and implementation of national mountain-specific policies appears to be fully consistent with the new and still evolving approach to integrated WM. Useful activities and tools to support decision-making in these areas could include:

- landscape inventories;
- representing examples of successful integrated WM and analysing their implementation mechanisms and impacts at various levels;
- reviewing/adapting methods and tools to identify and measure the positive externalities of mountain regions in relation to lowland areas;⁸²
- monitoring and evaluating the implementation, effectiveness and impact of mountain and WM policies;
- designing and implementing institutional mechanisms to enhance coordination among sectoral policies dealing with WM issues.

Decision-makers may consider M&E operations as expensive and risky; however, such activities are urgently needed as they can lead to policy reorientation and innovative programme design, as well as improved financial support tools. By involving local users and other stakeholders, M&E exercises are expected to provide useful elements for identifying WM, and proxy indicators that complement those already in use. These sets of indicators should cover:

- physical aspects related to improved NRM and environmental processes;
- qualitative/quantitative elements related to local livelihood conditions, as well as to the functioning and autonomy of local associations and decentralized administrative bodies; and
- performance and process indicators regarding the adaptation and coordination of national sectoral policies and their effective implementation at different levels.

M&E systems and WM indicators

Experience and existing sources of indicators for sustainable development and/or WM in the Mediterranean region⁸³ highlight the need to consider the following recommendations when adapting and improving M&E systems for WM and related indicators:

- M&E activities should be as closely adapted and linked to their clients and users as is possible. The results of M&E exercises should therefore be directly connected to the planning/replanning of WM activities, in order to improve end users' understanding and effective use of the information provided by M&E systems. This will also provide a useful opportunity for mobilizing and involving in WM processes those stakeholders⁸⁴ who have not taken part in previous planning and implementation activities.
- WM-specific indicators and proxy indicators should be identified and selected with as much stakeholder participation and contribution as possible.
- During the selection process, maximum use should be made of existing national, subregional and regional sources of information.⁸⁵

⁸² These could include identifying qualitative and quantitative indicators and analysing the costs and impacts of conventional WM compared with participatory integrated WM.

⁸³ See BP/RAC's Indicators for Sustainable Development (ISD) in the Mediterranean.

⁸⁴ Local user associations, as well as decentralized administrative bodies and decision-makers.

⁸⁵ Ministries of agriculture, planning and other areas, decentralized entities, research and academic centres, major donors, etc.

- The selection process should result in a limited but fully accepted and realistically manageable set of indicators and proxy indicators.

The following are examples of possible indicators and proxy indicators for WM:

- the extent and frequency with which M&E outcomes are used for planning/replanning purposes;
- the presence of national institutional focal points for WM-related matters;⁸⁶
- the presence of BAs (or equivalents) with decision-making power, which are responsible for managing a given watershed area;
- legal recognition and implementation of pricing for environmental services.

Box 16: Socio-economic features of mountain areas in Italy, 2002

The ongoing EC enlargement process has directed increasing attention to disadvantaged regions and areas. One question still to be answered is how best to define a disadvantaged or declining area. A recent study carried out by Italy's statistical institute CENSIS in September 2002 on behalf of the National Association of Mountain Communities (UNCCEM) highlighted the complex pattern of mountain communities within Italian regions (see Map 4). One of the main results of this exercise is the classification of mountain communities into six different groups, some of which comprise similar social groupings but very different income levels. Of these classes, only the two "extreme" ones can be considered to result specifically from recent dynamics in mountain areas; the other four are more the result of broader socio-economic dynamics at the national level. These two extreme classes include only a few communities, and represent a very small proportion of the national population.

In the highest "Mountain as a resource" class, there are 177 communities with a total population of 300 000 and an average income of about €23 000 per capita (about 150 percent of the national average). The lowest "Demographic decline" class comprises 556 communities, with 450 000 inhabitants and an average income of €13 200 per capita (15 percent below the national average). This class is also characterized by very low birth rates and a very high mortality rate. The socio-economic features of the other four classes of mountain area are the same as those of the urban and metropolitan suburbs in which they are located (for example, these mountain areas are declining if the nearby industrial district is in a critical phase, rural if local agricultural production is competitive, etc.). Moreover, living standards in these classes depend more on factors in the nearby urban district than on local infrastructure.

In response to these findings, in June 2003, the Italian Government attempted to reform the legal framework for mountain areas with the aim of defining disadvantaged territories more clearly and focusing actions and resources within these areas. However, the CENSIS report considered only the socio-demographic aspects of mountain areas (such as population size and density, gender and age groups, employment, housing, added value, and per capita income), and did not take account of other issues, such as landscape and environmental resources (national parks, forest coverage, niche-quality rural products, etc.). This is particularly significant in southern Italy, where the majority of mountain areas are classified as "marginal", while northern regions show more variety. As a result, in southern regions, a number of local mountain resources – well-landscaped plantations, niche-quality products, semi-natural forests and national/regional parks – risk being undervalued.

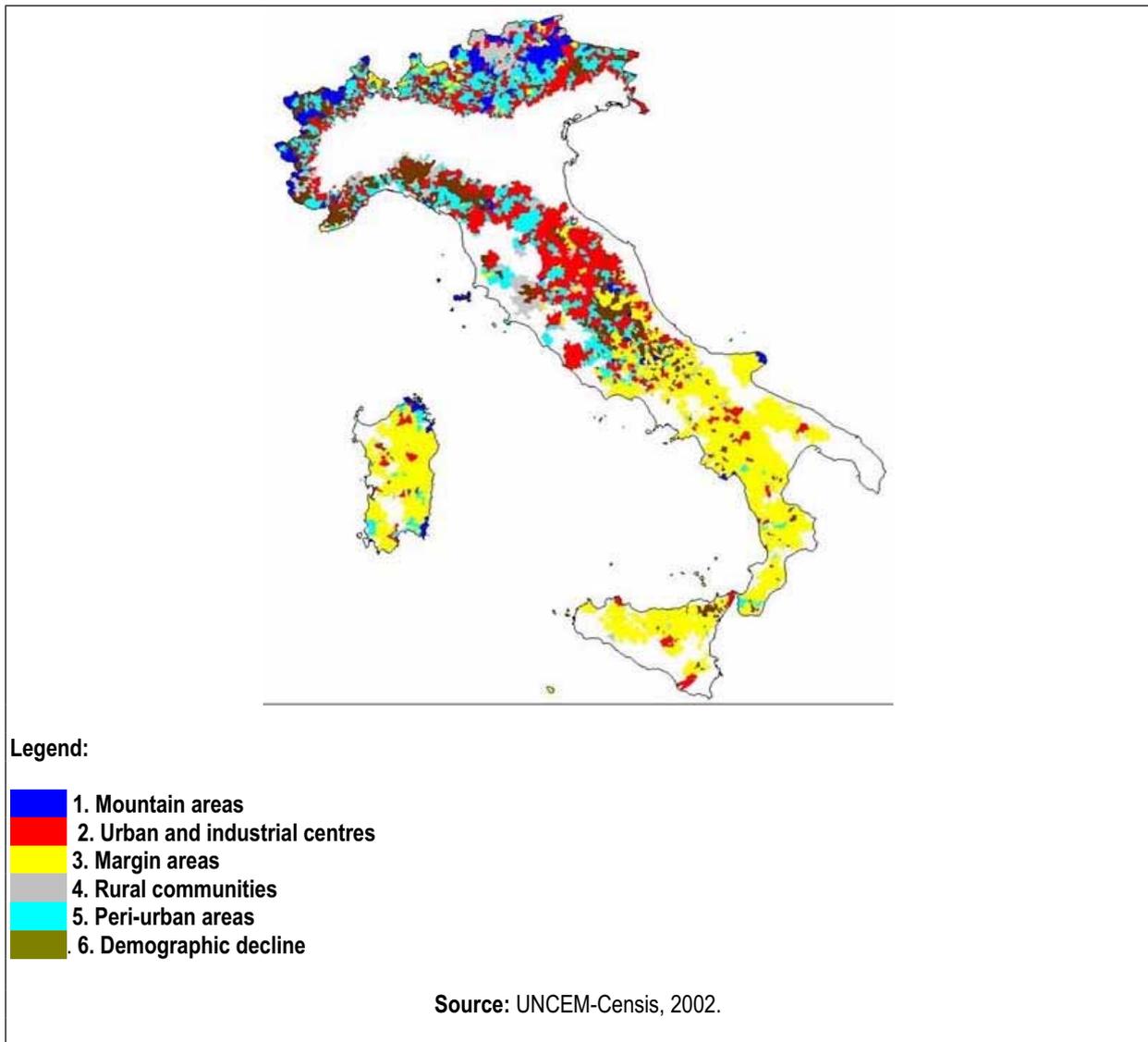
Networking and capacity building

The advantages gained from the systematic exchange of information and lessons learned via M&E exercises should constitute a strong incentive for establishing and/or strengthening national, subregional and regional M&E networks. These networks would in turn, strengthen the long-term coordination of WM activities among Mediterranean countries and facilitate the adaptation and harmonization of policies, approaches and practices within the region. It is important to involve

⁸⁶ Rather than continuing the dispersion and duplication of competences that exists in many Mediterranean countries today.

different stakeholders in improving and implementing capacity building actions, whose present shortcomings result from the conventional academic and/or technical approaches used.⁸⁷

Map 4: Mountain areas in Italy by typology



TECHNICAL ASPECTS

In many Mediterranean EC member and accession countries, recurrent floods dislocate large populations and cause persistent economic losses, while droughts severely limit agricultural productivity. In addition, widespread industrial and agricultural pollution affect most major rivers and degrade severely both surface and groundwater resources. If hydrological risks are to be managed and the economic benefits of water management attained, joint management at the basin and sub-basin levels is essential.

Because two-thirds of the coastal Mediterranean basin is mountainous and plays an important role at the watershed level, it is urgent to produce and disseminate disaggregated data on the problems and issues faced by mountain areas.

⁸⁷ This applies, for instance, to the European Forestry Commission's Working Party on Watershed Management (EFC/WPWM).

EC countries

The growing awareness of and attention to reducing erosion, landslides and floods are expected to lead to the design and implementation of wider-spread and more effective early warning systems.

Regarding soil protection, the focus is expected to shift from scientific and technical concerns (which are already well developed) to administrative and policy matters. The European Soil Forum,⁸⁸ for instance, aims to improve understanding of soil protection issues and promote the exchange of information among participating countries.

In the near future, it is expected that environmental concerns will be increasingly integrated into the CAP and resources will be shifted towards rural development, as foreseen by the Commission's Communication on Sustainable Development. This is likely to bring about the introduction of agricultural techniques that protect soil resources. Accordingly, land-use and WM techniques and tools will play an important role in supporting decision-making processes.

Non-EC countries

Several non-EC Mediterranean countries require capacity building in various technical aspects and at various levels. Decentralized cooperation mechanisms could here play a key role by facilitating effective competence and experience transfer among partner institutions in Mediterranean countries. Various EC programmes that are already assisting decentralized cooperation efforts could contribute to enhancing horizontal exchange and cooperation. Geo-referenced information systems and instruments at different scales – sub-watershed, watershed and river basin – are expected to be strengthened.

POLICIES AND INSTITUTIONAL ASPECTS

A likely general trend in WM policies is that all Mediterranean countries will focus in the near future on water pricing and improved land-use measures, including the design, adjustment and application of new taxes as well as incentive and disincentive measures.

Box 17: Italy/UNESCO coordinated action for the protection of environmental and natural/cultural heritage

In January 2003, Italy and UNESCO signed a Memorandum of Understanding (MOU) for Co-coordinated Action for the Protection of Environmental and Natural/Cultural Heritage, with "special attention to southeastern Europe and the Mediterranean region". The MOU provides for three years of cooperation to define, test and promote "strategies and action that improve environmental conditions and increase the rational use of cultural and natural resources". Actions to be undertaken will be defined annually by both parties and focus chiefly on capacity building in the following fields: i) sustainable use and management of surface and groundwater resources; ii) ecological rehabilitation of polluted sites; iii) promotion of traditional knowledge to combat desertification; iv) development of renewable energy sources and their use; and v) protection and conservation of natural and cultural resources for sustainable tourism.

There is a need to prepare a strategic WM programme that involves all riparian countries in water management and environmental interventions from the outset. Such a programme would apply to all relevant sectors and political as well as administrative boundaries. It would necessitate strong networking, exchange and collaboration among all the countries concerned. A significant role could be

⁸⁸ Created in 1999, this is based on a joint initiative of the European Commission and selected Member States called the Bonn Memorandum on Soil Protection Policies in Europe.

played by ongoing regional and international initiatives dealing with watershed and water management, such as:

- the RACs (BP/RAC, PAP/RACs based in Split, Athens, etc.);
- the Water Dialogue Consortium, which could extend its initiatives to the Mediterranean region;
- the national committees established by several countries during the 2002 IYM (France, Italy, Spain, Tunisia, Morocco, Croatia, Lebanon, Serbia and Montenegro and Slovakia);
- the planned multi-donor Partnership Programme for SMD.

EC countries

Several ongoing projects and programmes have involved partners – principally from the environmental sector – to address issues related to pollution control and water management. However, stakeholders from the agriculture sector should also be included and their roles and capacities in country efforts to comply with the EC Water Framework Directive (WFD) defined.

The recent reform of CAP in the context of Agenda 2000 is a step in this direction. It is likely to increase the importance of rural development policies as the second pillar of the CAP. The first package of reform measures, approved by the European Commission in January 2003, includes an important new principle: the “decoupling” of production and producer by introducing one single income payment per farm. The aim of this is to make farmers responsible stewards of their environment and rural landscapes.⁸⁹

In addition, within the market pillar of the CAP, the Agenda 2000 reform has recently introduced new environmental protection requirements. Under these, Member States adopt measures that they consider appropriate for their agricultural land-use or production situations, basing their decisions on the potential environmental impact of those measures. Such measures may include support in return for agro-environmental commitments, general mandatory environmental requirements or specific environmental requirements as conditions for direct payments.

These EC policies are likely to be accompanied on the one hand by additional measures related to the cohesion policy and the enlargement process, and on the other hand by the national adoption of the decoupling and cross-compliance principles. All these changes are likely to be reflected in WM and mountain area policies. In general, according to the EC’s decoupling and cross-compliance principles, the main focus of national legislations will be on promoting locally sustainable practices,⁹⁰ rather than on allocating new funds to increase production.⁹¹

⁸⁹ F. Fischler, Commissioner for Agriculture, Rural Development and Fisheries, MEMO/03/18, Outcome of the Agri/Fisheries Council of 27/28 January 2003, Brussels: “The core element of the reforms is decoupling. In return for their money, we believe that consumers and taxpayers deserve high-quality products, responsible stewardship of the environment by farmers and rural landscapes worthy of the name.... These payments would be conditional upon compliance with binding standards in environmental protection, food safety, animal health and welfare and occupational safety ... our proposal for decoupling explicitly recognizes the role of farmers in managing land and rural space, but says that this will no longer be taken for granted. The new single farm payment will not be paid to farmers who fail to manage land according to newly established land management obligations. We are therefore not paying our farmers to do nothing. Rather we pay them because we want to support farm income while ensuring adequate land management. In the past we encouraged farmers to produce too much at too high prices, in order to support their income. With our proposals, we don’t change our aim of supporting farm income, but we do so in a way that is more economically and socially acceptable. This is what we mean when we say we want to shift support from product to producer.”

⁹⁰ For example, the *Contrat territorial d’exploitation* (CTE) in France.

⁹¹ This is the case for the new Mountain Law that the Italian Government is now preparing. The law aims to establish legal recognition for mountain-specific issues, based on Article 158 of the Amsterdam Treaty, in order to promote an integrated programme of EC initiatives, including future cohesion policies.

Box 18: The EC Water Framework Directive (WFD) and WM

The consolidation of EC water directives within the WFD that came into force in December 2000 places new responsibilities on member and accession states. The WFD reforms EC water legislation by introducing a new model for water management. Its objective is to prevent further deterioration and to achieve “good status” for all waters. Its managerial approach is based on integrated water management at the river basin level and aims at ensuring the overall coordination of water policy in the EC. As a framework, the WFD focuses on promoting efficient and effective local water protection by providing a common approach and common objectives, principles, definitions and basic measures. The mechanisms and specific measures required to achieve “good status” will be implemented locally under the responsibility of competent (national, regional, local or river basin) authorities. Implementing the WFD is expected to result in improved water protection and allocation, reduced water treatment costs, increased amenity value for surface waters, and better coordinated administration of waters.

The key managerial elements of the WFD include:

- integrated river basin management across administrative and political borders;
- control of emissions and discharges of all pollutants into surface waters;
- specific controls for some (“riskier”) pollutants, on a priority basis;
- introduction of water pricing policies⁹² (guidelines for implementation of the economic aspects of the WFD will be developed in the near future);
- registration by 2004 of “protected areas”,⁹³
- greater public participation in EC water policy (all interested parties will be consulted about draft River Basin Management Plans [RBMPs] before they are adopted).

Key steps and expected outputs of the RBMP process are:

- a politically feasible, sustainable and rational joint management programme for major basins and sub-basins among concerned riparian countries;
- plans for conformity to the EC WFD, and specifically to the provisions of Council Directive 91/676/EEC of 12/12/1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources;
- a preliminary diagnostic review and definition of the extent of hydro-environmental risk for each riparian country in the basin, as a baseline for the RBMP and other interventions required for WFD compliance;
- a platform for the exchange of regional information related to EC WFD compliance;
- inter-ministerial dialogue among the appropriate agriculture, water, environment and forestry agencies in each riparian country;
- a full programme document, including a detailed implementation plan and budget that will achieve the objective of sustainable and rational integrated water management in major basins and sub-basins.

The control of pollution, particularly that caused by agriculture, has created problems in all EC member countries, especially regarding implementation of the EC Nitrates Directive (91/676/EEC). Moreover, applying the standard command and control approach has achieved limited success in controlling pollution. This was recognized in the fifth EC Environmental Action Programme Towards Sustainability, which recommended a broadening of the range of instruments for pollution control, including the use of voluntary agreements and the involvement of all stakeholders in the decision-making process. This has been further emphasized in the recently published sixth EC Environmental Action Programme, which recommends the full integration of environmental protection requirements into all EC policies, giving full consideration to all the options and instruments, and extensive dialogue among the stakeholders involved.

Source: Directive 2000/60/EC of the European Parliament and the Council, Water Framework Directive, October 2000.

⁹² Which by 2010 have to provide adequate incentives for efficient water use and take account of the principle of cost recovery for water services, including environmental and resource costs.

Simultaneously, increased focus on WM and mountain areas leads to the creation and/or strengthening of specialized institutions/agencies and services. In Greece for instance, the Metsovion Interdisciplinary Research Centre (MIRC) is active in protecting/developing mountainous environments and local cultures. In Italy the Istituto Italiano per la Montagna (INRM), created in 1999, promotes cooperative agreements among mountain-related academic and research institutes, as well as the development of much-needed mountain databases and GIS cartography. Italian national and decentralized authorities have also created a Mountain Information System that provides more than 850 mountain institutions with administrative, consultative and territorial services and e-learning.

Box 19: The debate on EC cohesion policy in mountain areas

The current EC cohesion funds directed towards mountain areas have only partially resolved the great disparities that they set out to address. Experts have noticed a lack of policy coordination, as well as insufficient attention to significant local dynamics, which are not reflected by statistics on income or social trends. In April 2003, representatives from structurally disadvantaged regions met⁹⁴ to discuss these and other issues related to cohesion and enlargement.

The Rapporteur, José Javier Pomés Ruiz (EPP-ED, E) pointed out "that experience since 1999 has shown that cohesion policy needs to be rethought to make it work more effectively and give better value for money. It became clear that not every mountain region was disadvantaged. Cortina d'Ampezzo in Italy or Lech in Austria are among the wealthiest areas in the Union." Pomés Ruiz argued that, in the future, cohesion policies should be more clearly differentiated. The conventional focus has been on economic and social objectives, while "territorial cohesion objectives" should be the real target.

Antonio Martinez de Bugado of the Asociación CEDERNA-GARALUR of Navarre (Spain) whose organization set up various schemes in the Pyrenees region, including more than 500 projects to benefit small and medium enterprises and create 2 500 jobs, said that: "mountain regions made an important contribution to sustainable development in the EU". He added "However, mountain regions remain vulnerable and should be supported by the Community as part of equal opportunities policies for all EU citizens."

The Vice President of the International Commission for the Protection of the Alps, Michel Ravez, pointed out that: "because the Alps were particularly sensitive at social, cultural, economic and environmental levels, it was in the interest of Europe to encourage a cautious, appropriate and modern policy for the development of this region.... The framework of this policy is the Alpine Convention. Fundamental steps should be taken in the field of regional development, tourism and transport, such as night and weekend bans for lorries on transalpine roads. New skiing areas and extensions of existing ones should also be banned."

However, not all members of the European Parliament shared the opinion that mountain regions are disadvantaged. Georg Jarzembowski (EPP-ED, D) told mountain representatives to count their blessings, because: "they had good air quality, hardly any traffic congestion, no drug problems and their banks were very rarely robbed".

Non-EC countries

EC accession countries are undergoing a transition from centrally planned economies to more market-oriented economic management. They need to establish a careful balance between the technical capabilities/visions of central water administrations and the interests of beneficiaries. This would lead to more equitable and efficient water management that involves managing hydrological risks, rather than attempting to minimize them, as has usually been the case in recent years.

⁹³ For example, areas that are identified in such EC legislation as nitrates and birds/habitats directives, areas for drinking-water abstraction, and areas that are identified in national or local legislation.

⁹⁴ At the EC Regional Policy Committees.

Complying with current EC Directives as part of the EC accession process provides these countries with the opportunity to use internal resources and international assistance to prepare important groundwork in the field of agricultural pollution control within the context of the EC/WFD and other EC legislation.

In general, the institutional transition process that most non-EC Mediterranean countries are currently undergoing appears to provide an important opportunity for reorienting policies and institutions and/or creating new ones. Among these policies, an increasingly crucial role will be played by the decentralization process and the related redistribution of competences among central and sub-national institutions, public and private agencies, NGOs and local associations.

Box 20: RED-IFO;⁹⁵ A model for analysing and supporting decentralization processes

There is growing consensus that rural sectors play a crucial role in reducing poverty, assuring food security and improving NRM. It is also recognized that decentralization can improve the performance of rural development activities. Decentralization and rural development have thus become major strategies of international organizations. However, consensus on its own is not enough, and each country must set up institutional mechanisms that allow consensus to be transformed into sustainable and participatory rural development.

The RED-IFO model is intended to help rural development actors identify the dangers and potential benefits of decentralization. The model's keystone is to establish the conditions that allow people to participate in selecting and implementing activities that will affect their future. To succeed, decentralization must be a general process that includes all forms of public intervention and a revised legislative framework in each country. However, for the rural sector, the main challenge of decentralization is how best to integrate collective local initiatives into the overall picture. Resolving the tension between the local and wider levels is difficult because: i) there is no room for manoeuvre and no political will to return to old-style state intervention; and, ii) a coherent overview is not simply the sum of local initiatives. Differentiation, regionalization and strengthened intermediary associations can help to resolve this issue because these three mechanisms create the conditions for dialogue among actors in rural development. In the RED-IFO model, FAO implicitly recognizes that decentralization cannot realize its full potential unless it goes hand-in-hand with reinforced democracy as a system for expressing interests, conflicts and mediation. The transition from a supply-based approach to a demand-based one can therefore be achieved:

- through pressure from the beneficiaries of policies;
- when decentralization does not cause vacuums; and
- by building a comprehensive, coherent and participatory strategy that encompasses specialized production and technological modernization, creates comparative advantages and does not benefit only the strongest and best organized actors.

It is therefore proposed that a new alliance for sustainable, viable and participatory rural development be created, with rural people's full participation "in the expansion of rural markets, savings and investment, all key ingredients in any rural development process." This new alliance will allow a shift from an "assistance" approach to rural development to a policy that identifies both agricultural and non-agricultural productive and profitable activities, and uses them effectively within the rural sector. Research into the economic alternatives, and extension of these to rural people, are therefore priorities. Decentralization assumes that what is not at the centre – i.e. is on the periphery, which is the target of decentralization – is strong and dynamic enough to allow its actors to take on the functions and activities that are being decentralized. Decentralization must focus on developing the rural sector in ways that expand production. The decentralization model must therefore redirect human and financial resources towards the rural sector, particularly its most disadvantaged members. This means recognizing that "investing in the sustainable development of the potential of agriculture, forestry and fisheries will cost much less in the longer term than solving the social problems that rural neglect is generating."

Source: FAO, 1996.

⁹⁵ Regionalization and differentiation methodology – Information training and organization.

The same applies in other countries, such as the Syrian Arab Republic, where the Ministry of Agriculture has recently established 20 new protected areas despite the absence of specific legislation for their management. In both the Syrian Arab Republic and Jordan there is an urgent need to develop national legislation that is in harmony with EC standards regarding certification of the quality of organic agricultural products, such as fodder and meat produced on rangeland areas, and to fix rules and regulations for locally managed range management plans.

In general, it can be expected that the focus of WM policies in non-EC Mediterranean countries will shift from target-oriented strategies, programmes and technical interventions to the identification and clarification of upstream–downstream linkages, including recognition of and payment for the environmental services offered by upstream areas.

Public services will progressively pull out from rural territories to leave place for the increased mobilization of local user groups and NGOs, which will also assume greater responsibility. Private companies' role in implementing soil and water conservation works under the supervision of line agency officers will be reinforced.

References

- Bank-Netherlands.** 2001. Water Partnership Program, Watershed Management Window (technical note) <http://www.state.hi.us/dlnr/dofaw/wpp/>
- Brooks, K.** 1993. *Challenges in upland conservation*. Bangkok, FAO-RAPA.
- European Commission.** 1994. *Report on desertification and land degradation in the European Mediterranean*. Brussels.
- European Commission.** 1996. *Rural Europe, future perspectives*. Cork Declaration, European Conference on Rural Development, Cork, Ireland.
- European Commission.** 2001. Unity, solidarity, diversity for Europe, its people and its territory. In *Second report on economic and social cohesion, Volume 1. Regional policy*. Luxembourg.
- European Commission.** 2002a. Rural development and mountain areas: a first assessment seminar. EU Policies and the Mountain. Brussels.
- European Commission.** 2002b. *Verso una strategia tematica per la protezione del suolo*, COM(2002) 179. Brussels.
- European Environment Agency.** 2001a. *Down to earth: soil degradation and sustainable development in Europe*. Brussels.
- European Environment Agency.** 2001b. *Sustainable water use in Europe: extreme hydrological events – floods and droughts*. Environmental Issues Report No. 21/01 Part.3. Copenhagen.
- FAO.** 1996. *RED-IFO: A decentralization model*. Decentralization and Rural Development No. 3. Rome.
- FAO.** 1997. *La réorientation participative du programme de reboisement de la forêt de Sidi Salem*, by A. Ambroso. FAO-GCP/INT/542/ITA. Tunisia.
- FAO.** 1998. *Developing participatory and integrated watershed management*, by P. Warren. Community Forestry Case Study Series No. 13. Rome
- FAO.** 2000a. *Evaluation study of the Projet de Développement Rural Intégré de l'Ader-Doutchi-Madja, Niger*, GCP/NER/028/ITA.
- FAO.** 2000b. FAO E-Workshop Land and Water Linkages in Rural Watersheds, by J.M. Faurès. Rome.
- FAO** 2002. *Working together in watersheds: Comparative analysis of upstream–downstream cooperation agreements for hydrological services in rural watersheds*, by C. Freisen. Rome. (draft)
- FAO.** 2003. *Towards a GIS-based analysis of mountain environments and populations*. Environment and Natural Resources Series Working Paper No. 10. Rome, FAO-GIS Unit (SDRN).
- INRM.** 2002. *Usa del suolo come difesa - Rapporto di sintesi*. Rome.
- Italian Ministry of Environment.** 2000. *Classificazione dei comuni italiani in base al livello di attenzione per il rischio idrogeologico*. Collana della Relazione sullo Stato dell'Ambiente. Rome.
- Land-Water MED.** 1999. *Geo-information for sustainable management of land and water resources in the Mediterranean Region*. Proposal No. ICA3-1999-30040.
- MAP/UNEP-PAP/RAC.** 1995. *Guidelines for integrated management of coastal and marine areas with particular reference to Mediterranean basin*. Nairobi.
- OECD.** 2000. *Greece, environmental performance review*. Paris.
- Omerani, A.** 2002. Watershed management. In FAO. *Institutional implications of participatory approaches*. Decentralization and Rural Development No. 20. Rome.
- Sava River Basin Commission.** 2002. *Framework Agreement of the Sava River Basin Commission*. Stability Pact for Southeastern Europe. Kranjska Gora, Russian Federation.
- UNCHEM-Censis.** 2002. *Il valore della montagna*. Rome.
- UNEP.** 1992. *World atlas of desertification*. London, Edward Arnold.
- UNEP.** 2000. *Guidelines for erosion and desertification control management*. Nairobi.
- UNEP-WCMC.** 2002. *Mountain Watch*.
- Zingari, P.C.** 2002. Effective watershed management: a European perspective. In *Preparing the next generation of watershed management programmes*. Proceedings of FAO/EOMF European Regional Workshop. Mègeve, France.

ANNEX 1: SUMMARY OF MAIN ACHIEVEMENTS, GAPS, LESSONS LEARNED AND PERSPECTIVES FOR WM IN THE MEDITERRANEAN REGION

	Achievements	Gaps	Lessons Learned	Perspectives
Approaches and methodological aspects	<ul style="list-style-type: none"> Integrated and participatory approach being adopted and internalized Territorial dimension of WM being developed 	<ul style="list-style-type: none"> Polluter-pays principle still to be accepted/enforced Inland upper watershed areas seen by lowlanders mainly as recreational zones 	<ul style="list-style-type: none"> Decentralized entities need to strengthen links with LFAs and improve their image Available experiences (both positive and negative) should be studied in detail for possible replication 	<ul style="list-style-type: none"> Both top-down and bottom-up approaches should include wider ranges of actors and stakeholders Recent trends should be emphasized Attention to water resources and WM impact analysis at the river basin/sub-basin level is expected to increase Adequate incentives and new forms of payment for environmental/hydrological services are required General consensus on long-term action should involve reorientation of policies/regulations Increased attention to the local context is leading to adaptation of WM and rural development approaches/policies
Technical aspects	<ul style="list-style-type: none"> Flexible portfolio of techniques and instruments available Historical series of data allow forecasts Improved technical measures through better vision of upstream–downstream relationships 	<ul style="list-style-type: none"> Lack of M&E Weak coordination of technical services/institutions Inequitable availability of information between upland and lowland areas 	<ul style="list-style-type: none"> Follow-up evaluation required for policy orientation Communication techniques would help to link land users, managers and researchers WM should look at underlying causes of degradation and not be limited to treating symptoms Networking and sharing of information is required 	<ul style="list-style-type: none"> Economic losses due to recurrent floods, droughts and water pollution demand stronger management at the basin/sub-basin level and more effective early warning systems Disaggregated data for Mediterranean mountain areas are required Environmental concerns are increasingly incorporated into EC policies
Policy and institutional aspects	<ul style="list-style-type: none"> Negotiation and co-management mechanisms are promoting coordinated action at national/decentralized levels Recent EC policies are promoting a more comprehensive territorial vision 	<ul style="list-style-type: none"> Experience of upstream–downstream linkages and payments for environmental services have not been sufficiently analysed, exchanged and disseminated 	<ul style="list-style-type: none"> Key principles (e.g. polluter-pays) can be implemented effectively when involved actors have sufficient income Present legal/policy instruments (e.g. PAC) are not sufficiently specific to deal with mountain diversity/complexity New trends for cultural tourism and ecotourism should be optimized in favour of SMID 	<ul style="list-style-type: none"> Focus on water pricing, improved land use and incentive and disincentive schemes Increasingly felt need for a Mediterranean strategic WM programme EC principles of decoupling and cross-compliance are expected to promote sustainable practices and institutional adjustments at the local level, including the establishment of new specialized agencies/services
EC countries				

<p>Approaches and methodological aspects</p> <ul style="list-style-type: none"> • Diffusion of new participatory policies • Emerging experiences of effective coordination among technical services • Results of RAC activities are promoting scaling up 	<ul style="list-style-type: none"> • Difficult to internalize results generated by innovative field initiatives • Programmes remain mainly target-oriented 	<ul style="list-style-type: none"> • Partial involvement of local users in defining/deciding technical options • Increased awareness of the need for integrating soil and water management 	<ul style="list-style-type: none"> • Encouraging experiences of national/regional negotiation processes and coordination agreements
<p>Technical aspects</p>	<ul style="list-style-type: none"> • Conventional use/extension of limited/rigid technical packages • Insufficient use of geo-referenced territorial information systems • Technical interventions often concentrate on large farms in foothills • Lack of information on and attention to traditional expertise • M&E systems are almost absent 	<ul style="list-style-type: none"> • Local technical agents need retraining as facilitators/development promoters • Resistance to interservice working teams • Marginal farmers' traditional risk control practices require adaptation of conservation techniques • Negative attitude towards M&E in target-oriented environments requires careful selection of M&E information • Large potential for national and subregional experience exchange 	<ul style="list-style-type: none"> • Rapid modernization process in productive/processing activities requires specific policies for marginal upland areas • Poor upland areas still require public subsidies/incentives • Effective dialogue processes require a variety of complex preconditions, as well as resources and policy support for long-term action
<p>Policy and Institutional aspects</p>	<ul style="list-style-type: none"> • Difficult to internalize results generated by innovative field initiatives • Programmes remain mainly target-oriented 	<ul style="list-style-type: none"> • Administrative decentralization/reorganization processes not allowing the identification/strengthening of national focal institutions 	<ul style="list-style-type: none"> • New rural development and agricultural policies are expected to play an increasing role, also owing to inclusion of environmental concerns • Attention to equity and efficiency gains deriving from water management will increase the focus on hydrological risk management rather than risk minimization • The ongoing institutional transition period (e.g. in the Balkans) represents a significant opportunity for policy/institutional reorientation, including at the decentralized level • Public services are expected to withdraw from the rural territory in favour of local users' associations, NGOs and private enterprises

Non-EC countries

ANNEX 2: THE BLUE PLAN

The Blue Plan was established by the governments of the Mediterranean Basin and the European Union following an intergovernmental meeting held in Split in 1977, in the framework of the Mediterranean Action Plan (MAP), which is under the aegis of the United Nations Environment Programme (UNEP). Its mission is to promote and assist development cooperation efforts in the Mediterranean Basin by providing the authorities of the rim countries with adequate information, studies and analyses aimed at enabling them to achieve sustainable socio-economic development without causing environmental degradation. Long-term studies carried out on behalf of the Blue Plan, and currently being updated, have shown that the sustainable development of the Mediterranean region requires a significant change in existing scenarios through the design and implementation of new strategies and policies capable of integrating environmental and development concerns at the local, national and regional levels, and stronger regional cooperation in the framework of the Euro-Mediterranean partnership.