TOUR DU VALAT

MedWet

Conservation of Mediterranean Wetlands

Integrated Management of Mediterranean Wetlands

B. Bonnet, S. Aulong, S. Goyet, M. Lutz & R. Mathevet

MedWet

The MedWet initiative

The Mediterranean basin is rich in wetlands of great ecological, social and economic value. Yet these important natural assets have been considerably degraded or destroyed, mainly during the 20th century. MedWet is a concerted long-term collaborative action, launched in Grado, Italy in 1991, to stop and reverse this loss and to ensure the wise use of wetlands throughout the Mediterranean.

The MedWet initiative is guided by the Mediterranean Wetlands Committee (MedWetCom), under the umbrella of the Ramsar Convention on wetlands, which brings together 25 governments from the region, the European Commission, the Barcelona and Bern Conventions and international NGOs. It seeks partners and funds for implementing the Mediterranean Wetland Strategy, which includes conservation actions in wetlands of major importance in the region (especially Ramsar sites) and the promotion of national wetland policies, which take account of wetland values during the planning process. MedWet also provides a forum for regional exchange of experience at a technical level and publishes a range of wetland management tools with financial support from the European Union.

The concept of MedWet and its importance for promoting wise use of Mediterranean wetlands has been unanimously endorsed by the Contracting Parties to the Ramsar Convention on wetlands.

The MedWet publication series

Wetlands are complex ecosystems, which increasingly require to be managed in order to maintain their wide range of functions and values. The central aim of the MedWet publication series is to improve the understanding of Mediterranean wetlands and the policy issues that surround them, and to make sound scientific and technical information available to those involved in their management.

Bernard Bonnet, Stéphanie Aulong, Sylvie Goyet, Marc Lutz & Raphaël Mathevet
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Titles of the collection:

1. Characteristics of Mediterranean Wetlands
2. Functions and Values of Mediterranean Wetlands
3. Aquaculture in Lagoon and Marine Environments
4. Management of nest sites for Colonial Waterbirds
5. Wetlands and Water resources
6. Aquatic emergent Vegetation, Ecology and Management
7. Conservation of Freshwater Fish
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Conservation of Mediterranean Wetlands
MedWet

Integrated Management

of Mediterranean Wetlands

Concepts, lessons and approaches
for integrating conservation into land use management

Bernard Bonnet, Stéphanie Aulong,
Sylvie Goyet, Marc Lutz & Raphaël Mathevet

Number 13

Series edited by A.J. Crivelli and J. Jalbert

Preface

Wetlands – transition systems between land and water – constitute a remarkable natural heritage. As a result of their biological richness, they fulfil a number of important functions. For centuries, Mediterranean wetlands have been important for the provision of food (game and fish), raw materials (reeds, peat), and cultural and social customs. Increasingly as well, they are being recognized for their value in terms of hydrological regulation and improvement of water quality. Highly productive ecosystems, second only to equatorial forests in terms of biomass productivity, they host a great diversity of species. Mediterranean wetlands are a globally important chain of roosting, feeding, wintering and breeding points along the African-Eurasian flyways for an estimated two billion migratory birds of 150 species.

Today, these remarkable ecosystems are being threatened: drainage, reclamation, over fishing and pollution have dramatically reduced the surface area of wetlands in the Mediterranean region or critically endangered the quality of the waters and habitats. The challenge is to stop their destruction and degradation while maintaining their vital social and economic functions. Targeting this fine balance is what integrated management of wetlands is all about.

The MedWetCoast project, with the assistance of partners (Station biologique de la Tour du Valat, Atelier Technique des Espaces Naturels, Conservatoire du Littoral for the technical support; Agence Française de Developpement, FFEM, GEF, UNDP, MedWet and MAP for institutional support), is assisting government authorities and local communities in Albania, Egypt, Lebanon, Morocco, Palestine Authority and Tunisia.

This publication in the MedWet series should be welcomed by all those involved with wetland management and conservation. It provides the ingredients for the integrated management of Mediterranean wetlands. It capitalizes upon the lessons learned in the region, in particular through the work of the Station biologique de la Tour du Valat, IRAM and the MedWetCoast project. In addition, this publication will make a useful contribution to the effort of the UNDP and the GEF in pragmatically advancing the concept of integrated land and water management.

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Tour du Valat

Introduction

Aware of and motivated by the issues involved in the protection of wetlands, conservation practitioners are faced with problems of a methodological nature that are crucial in the development of a strategy for the more sustainable management of such areas. These problems are associated with the complexity and diversity of the natural habitats, but also relate to the involvement of actors and policies in the definition and implementation of innovative and viable initiatives and techniques.

"Areas of marsh, fen or peat bog, or natural or artificial water bodies, permanent or temporary, where the water may be running or still, fresh, brackish or saline, including stretches of sea water whose depth at low tide is not greater than six metres": this is the definition of wetlands in Article 1 of the 1971 Ramsar Convention.

Water management in the Camargue

In Mediterranean regions, they occur more particularly in the forms of temporary or permanent marshes, reservoirs, water courses, deltas and lagoons.

Situated at the meeting point of land and sea, Mediterranean wetlands are among the most fertile ecosystems on the planet. They provide a very wide range of habitats for plant and animal species whose characteristics and importance are still underestimated and little known. The rich natural potential and ecological heritage of these areas has attracted human activity since prehistory, resulting in their development. This, taken to the extreme, can bring about their complete disappearance or the loss of some of their values or functions. These very real threats, accelerated by human pressures exerted all around the Mediterranean, raise the issue of the conservation of these wetlands in the face of pressure from a wide range of factors: urban development, pollution, agricultural development.

More and more, the necessity of protecting these areas is beeing acknoledged, and for the last decade or so this has led to increased attention among international and also local bodies for the protection of these habitats. While it translates into commitments by nation states, communities and societies, the question of the methods that must be used for integrating the conservation of these places into the physical planning of the areas in which they lie remains unresolved. How to make these conservation concerns more widely shared? How to genuinely translate these into actions in line with the issues? How to promote integration at different levels: the level of actors and users, the level of policies emanating from various levels and sectors? How can the actors and users be successfully integrated into the design, implementation and running of programmes for the conservation management of these exceptional resources? How to ensure that these conservation and management actions are fully recorded and pragmatically translated into the physical planning policies where these wetlands are situated, whether at the local, regional or national level?

Such are the questions that the present document wishes to address. The aim of the book is to document the current thinking and experiences, in order to encourage those who are already broadly committed to the effort and also to raise interest in approaches which attempt to link conservation of natural resources with the strengthening of social links among all stakeholders.

In order to shed theoretical and practical light on these various questions, this work is organised in three sections:

The first section focuses on the specific characteristics of Mediterranean wetlands, from the social and economic, as well as ecological, point of view. It spells out the major issues that warrant the case for protecting and improving the management of these areas.

The second section reviews the development of concepts related to conservation, biodiversity protection and the relationship between environment and society. Using various established analytical frameworks, the aim is to clearly define a concept of integrated management which, as per the work of the reviewed authors, accords a central role to the societies involved.

The third section is devoted to more operational aspects, intended for the practical application of experiences relating to the integrated management of Mediterranean wetlands. It does not intend to present a detailed guide to an approach. And it would be inappropriate to try to standardize such an approach. But it wishes to emphasize the key questions which the actors involved will have to ask themselves, in their own particular contexts, as they seek to build an integrated approach to management.

This system of questioning is developed more specifically, wherever possible, through examples of concrete experiences in the management of Mediterranean wetlands in different countries.

Medwetcoast Lebanon

Environmental education session for schoolchildren (Lebanon)

J.-P. Taris / Tour du Valat

The issue of conservation

Mediterranean wetlands support an exceptional degree of richness, but are also characterised by a high level of complexity. Given the range of different pressures acting upon these resources, a strategy that integrates conservation issues is now of fundamental importance.

Ponds and marshes are characterised by shallow water levels (generally less than 2 m deep), which means that there is no stratification of water layers according to temperature and light penetration, and which tends to promote the growth of both aquatic vegetation (hydrophytes: duckweeds, algae, water lilies, pondweeds, etc.), and semi-aquatic plants (helophytes: reeds, bulrushes, sedges, etc.).

Wetlands in the Camargue (Aigues-Mortes)

Areas or regions of marshland concentrate dozens of various types of wetlands in an interactive, cohesive and complex area formed by water bodies and their surrounding environments: marsh, grasslands, heaths, woodland, fields, etc.

Mediterranean wetlands require specific management and conservation practices. For one, it is by virtue of the fragility and richness of these habitats set between land, water and sea, providing the essential underpinning for a high level of biodiversity and for water management. Two, the region's wetlands are characterized by the irregularity of their flows and their very marked seasonality (between flooding and drying out), which brings natural equilibria and the complexity of the functional dynamics of these ecosystems into play. They are also interdependent on the rest of the catchment area from the spatial and ecological point of view. They are subject to a wide range of activities and uses, which creates major issues for the regulation of access by various user groups. In addition, these habitats are faced with very intense threats as they are situated in areas undergoing some of the highest rates of increase in human population density and intensification of economic activities (pollution, drainage, urban development, etc.)

Finally, the perception of wetlands by society has noticeably changed. Treated for a long time as unhealthy places in need of purification (draining and mosquito control), their use was orientated towards urban development and industrial activitiy. This concept is beginning to give way to a more appreciative perception of wetlands (biodiversity, hydrological uses, leisure, etc.).

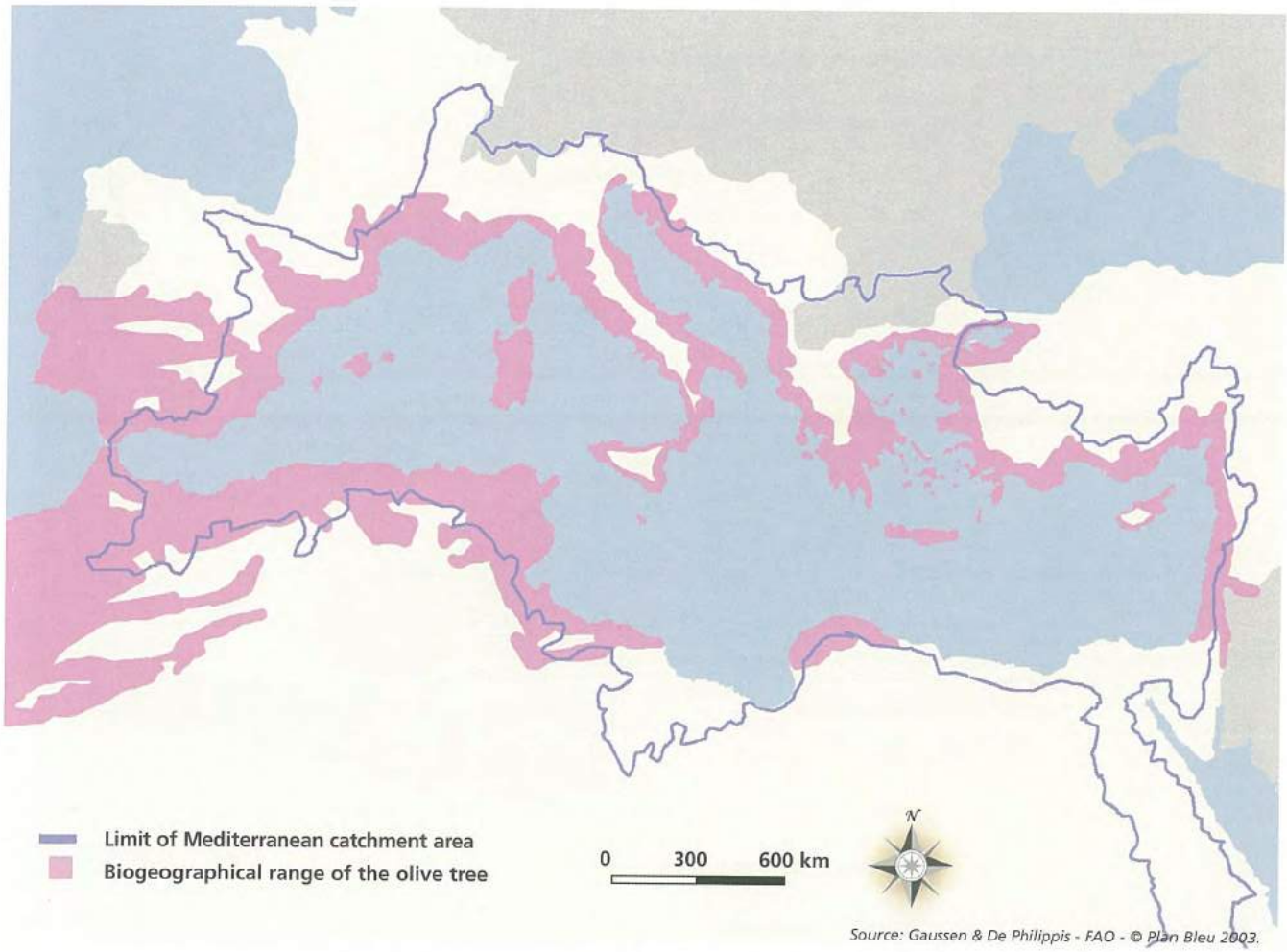
These different characteristics result in a high degree of complexity in the management of wetlands and require actions that address at the same time the technical field of conservation, the social field of negotiation and the political field of land use planning.

Fragile, diverse, multifunctional spaces

Many different kind of sites on the shores of the Mediterranean

A large proportion of wetlands are concentrated around the deltas of Mediterranean rivers: the Ebro delta in Spain, the Camargue in the Rhone delta in France, the Po delta in Italy, the combined mouths of the Axios, the Aliakmon and the Loudias; the Nestos delta, the Evros delta between Greece and Turkey, the Menderes delta in western Turkey, Nile delta in Egypt (one of the most important), Medjerda delta in Tunisia. Additional Mediterranean wetlands include lagoons such as the Aiguamoll de l'Emporda in Spain and the lagoons along the Languedoc-Roussillon seaboard in France.

The Mediterranean area: a variety of countries by the sea



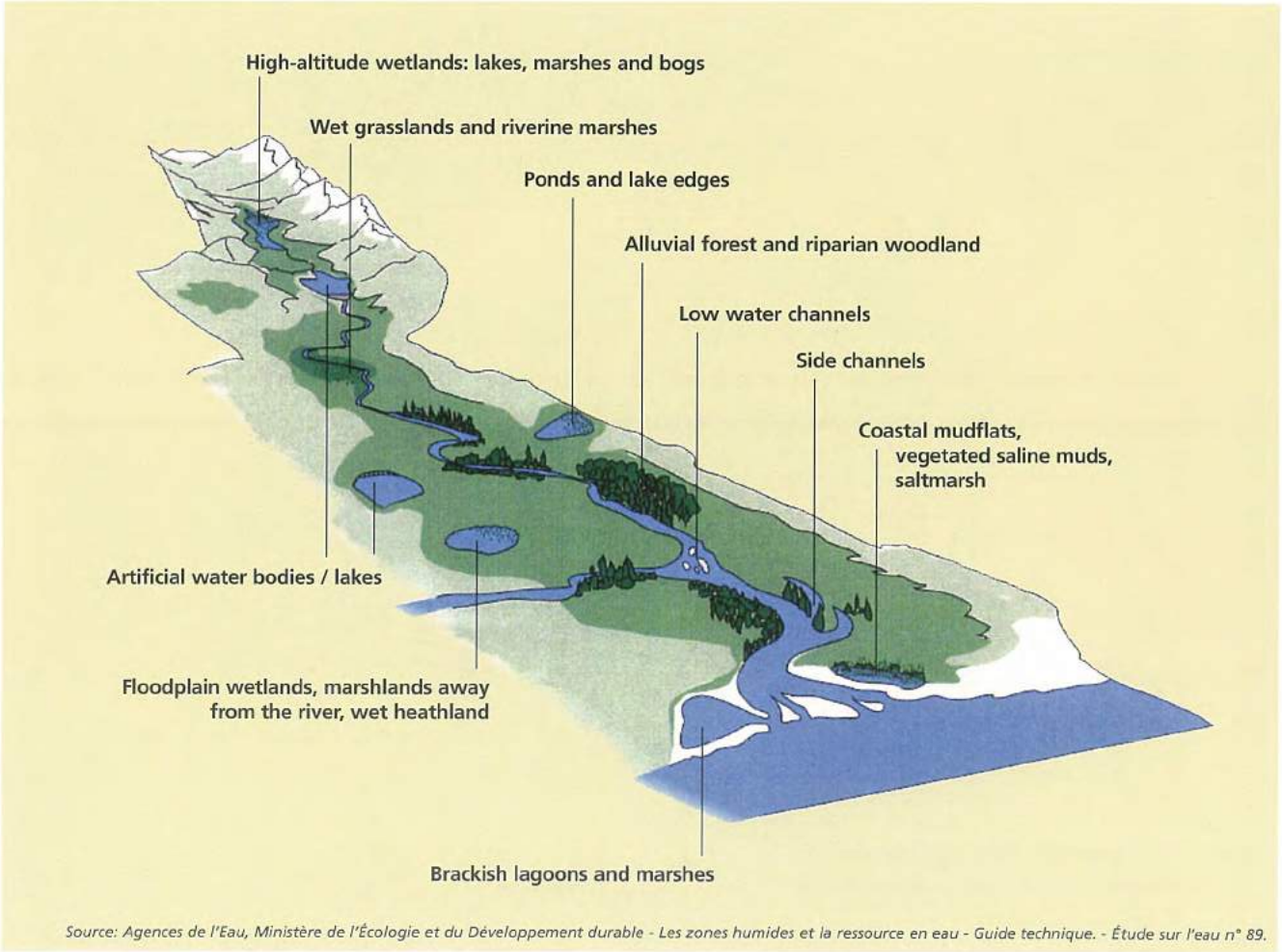
Source: Gaussen & De Philippis - FAO - © Plan Bleu 2003.

Ecological richness and biological diversity

Wetlands exist in a wide range of different forms as a result of the varying types of underlying hydrological regimes. The outline below proposes a typology on the basis of the siting of these wetland ecosystems in relation to the various levels of the catchment area which supplies them.

Our review of the management of Mediterranean wetlands will focus more specifically on the characteristics of areas located at the interface between fresh water and salt water, i.e. brackish lagoons and marshes, coastal mudflats, vegetated saline muds, saltmarshes, and side channels.
One would use four key factors to determine the ecological identity of these ecosystems: depth of water, salinity, temperature, oxygen. These four natural factors act together and are subject to extreme variations according to the seasons, producing very specific living conditions.

Diversity of wetland types from the point of view of their hydraulic regime



Source: Agences de l'Eau, Ministère de l'Écologie et du Développement durable - Les zones humides et la ressource en eau - Guide technique. - Étude sur l'eau n° 89.

Biological demands in brackish marshes and lagoons

Shallow water, varying from 1 to 1.20 metres in depth			
In winter	Low salinity 5 to 7 ‰ of salt	Temperature relatively low 10-15°C, sometimes frozen	High oxygen content
In summer	Maximum evaporation 40 ‰ of salt	Very warm 20-25°C	Low oxygen content

The wetlands created by these variations support a very wide range of plants and animals which demonstrate the extremely wide biological diversity within Mediterranean wetlands. The geographical ranges of over 80% of the protected species listed in the European Directive 92/43/EEC known as the "Habitats Directive" (92/53/EEC) are located around the Mediterranean, with a good number of them being associated with wetlands[1]. It has been possible to study only a very low proportion of their vast genetic resources. Many rare and endangered species live in wetlands or depend on them for their survival. Some animals and plants require a particular wetland type to live, while others only live out a part of their life cycle there or visit them for specific reasons: to rest, to breed or to feed.

- Birds

Of the 29 Mediterranean species threatened with extinction[2], 8 are wetland species, such as Marbled Duck *(Marmaronetta angustirostris)*, White-headed Duck *(Oxyura leucocephala)*, and Dalmatian Pelican *(Pelecanus crispus)*. The ecological changes observed in the Nile Delta, where the aquatic vegetation tends to disappear, result in a significant fall in the numbers of some species which used to be the commonest: Coot *(Fulica atra)* with an 83% decrease, and Shoveler *(Anas clypeata)* with a 44% decrease. In addition, the Mediterranean constitutes a major crossroads on the main waterbird migration routes.

- Fish

The freshwater fish fauna is remarkable and is characterised by a high degree of endemism, with 49 indigenous species. Migratory species such as the Eel and the Sea Bass are particularly important in terms of conservation and human use. Wetlands play a key role in their breeding cycles.

1. Skinner J., Zaleski S. (1995)

2. Skinner J., Zaleski S., op. cit.

• Amphibians and reptiles

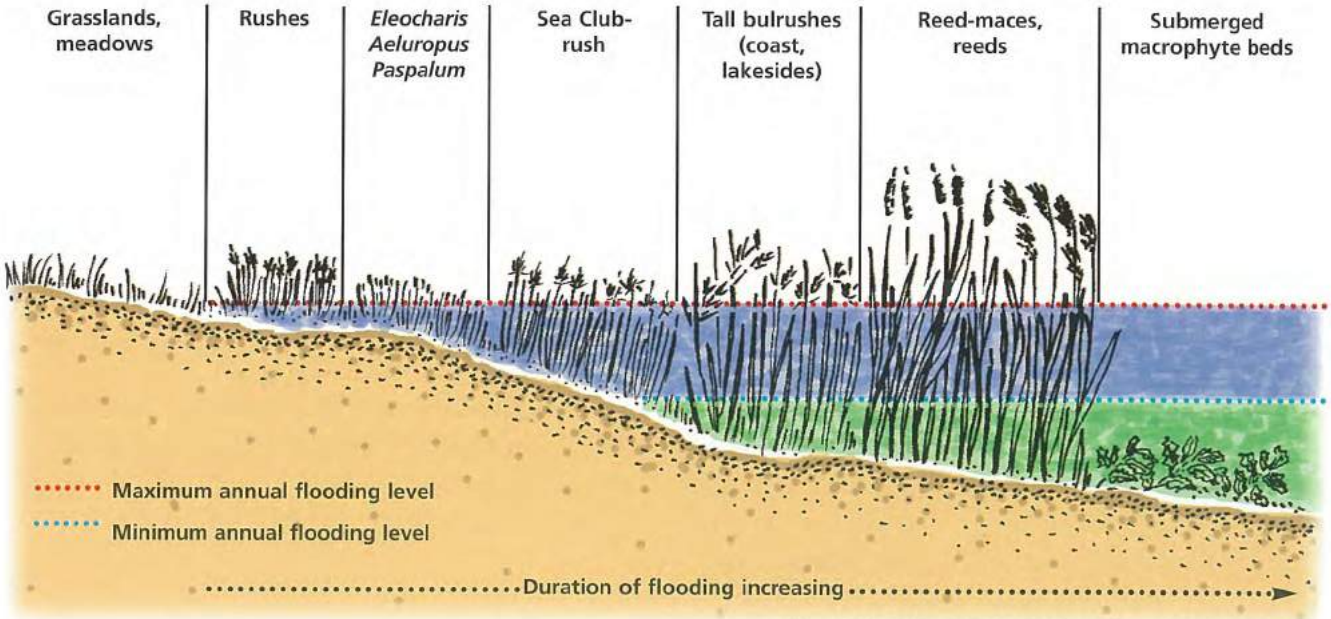
Frogs, toads and newts rely on the aquatic environment for breeding, but suitable terrestrial habitat (grassland, heath, forest, etc.) is equally essential. Around 50 species of amphibians are found in the Mediterranean region. 27 of these are endemic, i.e. restricted to this geographical region. Some reptiles, such as grass snakes, vipers and terrapins, are abundant here. *Trionyx triunguis*, the rare African soft-shelled turtle, lays its eggs at the Göksu delta in Turkey.

• Mammals

Although mammals are relatively rare in the Mediterranean region, the presence of some emblematic species should nevertheless be emphasized. For example the Doñana National Park in Spain supports the rare Iberian Lynx *(Lynx pardellus)*; the Otter *(Lutra lutra)* also finds some of its last Spanish refuges in wetlands, such as the Daimiel National Park.

This biological heritage still remains inadequately known from a scientific point of view. At many sites, some species remain to be discovered, in particular among the entomological fauna, or else still remain very poorly known as regards their roles in the ecosystems. The natural heritage of wetlands constitutes a huge field for fundamental and applied research, which needs to be further developed.

Complexity of wetland water regimes and biodiversity



Source: Medwet Tour du Valat, Booklet n° 6, La végétation aquatique.

Caspian Tern

Tour du Valat

This diversity of species among the flora and fauna of wetlands alone justifies the need to preserve the sites which still support this biological heritage. Also, beyond their biological interest, effective conservation of wetlands is essential for major productive sectors (fish, shellfish, grazing, reed, etc.). As previously emphasised, wetlands are the natural habitat of many animals (invertebrates, fish, birds and mammals) that form the basis for numerous food chains which are of direct interest to human activities. These habitats are at the origin of many plant and animal products from which rural and urban communities profit directly or indirectly. It should also be

From geographical determinism to human mastery of the land[1]

Inundation of the agricultural land by annual floods and the high quality of the regularly renewed alluvial soils made it possible for large human populations to live in the Nile delta. These populations tended to settle where the land was richest and where hydrological management was most easily achieved. In an environment that depended as much on water as on the delta land of the Nile, colonisation of the area by people was thus conditioned by their ability to irrigate and drain the land; it began in the highest areas and spread to the low-lying areas. "It is water that created the geographical regions here with their particular characteristics. It is according to the greater or lesser facility with which water may be brought in or directed away that the country is fertile or barren, populated or relatively deserted. The main cause of the differences is a matter of irrigation and drainage, and ultimately it is the level of the land and the distance to the sea which have formed the region...[2]."

1. Fanchette S. (1997)

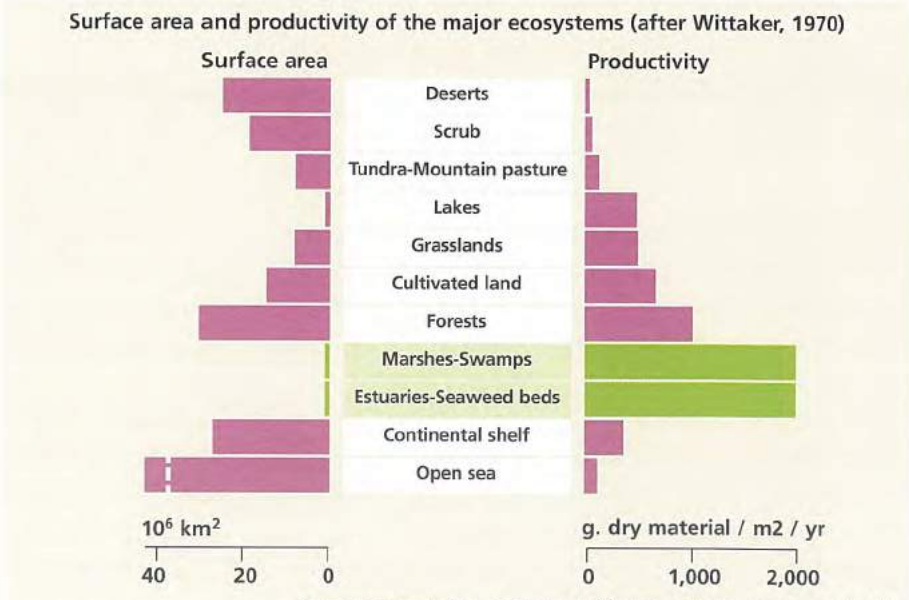
2. Lozach J. (1935)

noted that the rationale behind the establishment of human communities is strongly linked to the presence of water supplies (rivers, ponds, lagoons, deltas), next to which humans have settled in order to fish, hunt or cultivate the extremely productive, fertile and irrigable wetlands.

This production of animal and plant material reaches its highest level in coastal marshes and estuaries. These provide up to twenty tonnes dry weight of material per hectare[1]. This high rate of primary production in wetlands is linked with interchanges of organic and inorganic material between the terrestrial and aquatic components and between dry land and sea. In comparison, as shown in the figure below, the productivity of forests is on average only half this rate and that of cultivated land only a quarter.

Multiple functioning of fragile, complex ecosystems

Wetlands fulfil a number of functions which contribute directly to human activities:
Wetlands fulfil hydrological functions, playing the role of a "natural sponge" that is of great importantance in regulating the flow rates of watercourses, preventing flooding, replenishing the groundwater, purifying the water, etc.
They fulfil biological functions as they provide essential migration-nesting sites for very many species. The fluctuating mixture of inputs of fresh water and inflows from the sea forms the basis for a very special aquatic fauna and flora.



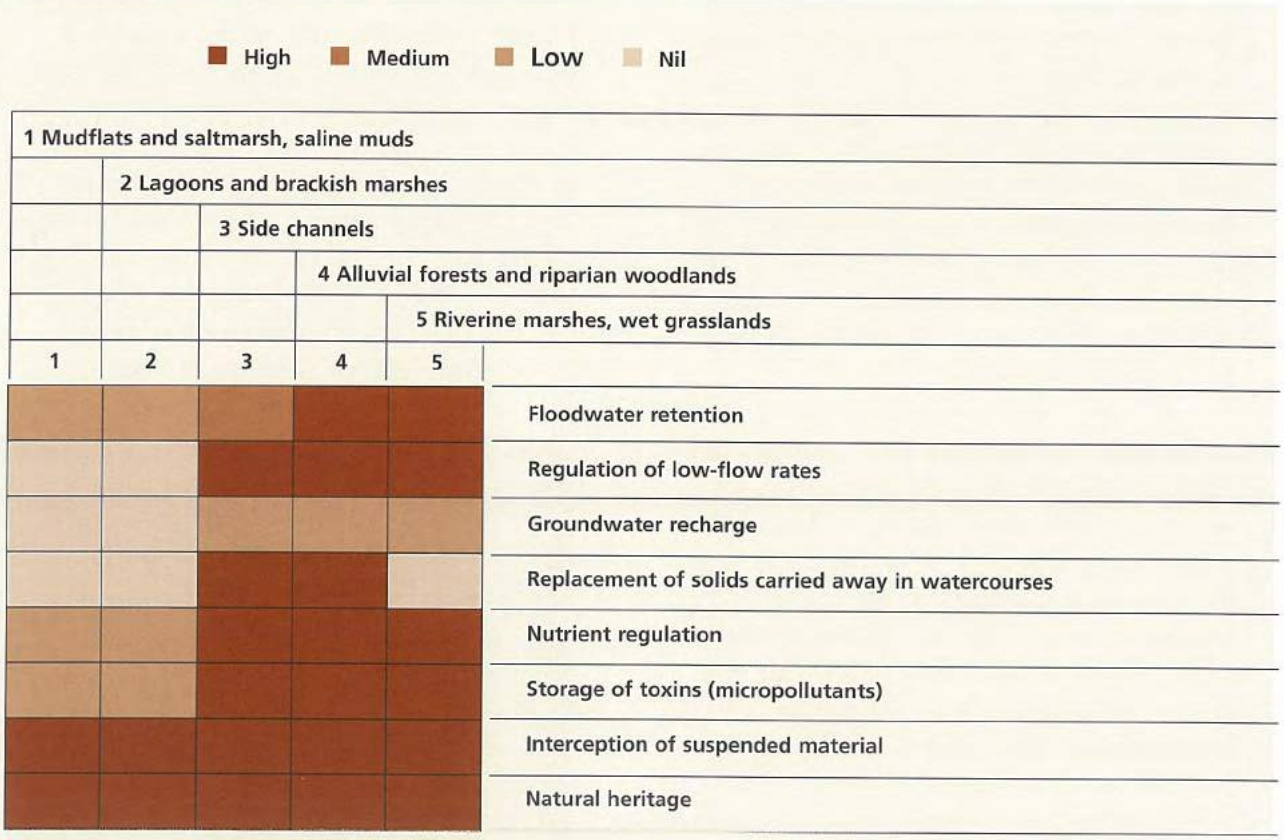
Source: Agences de l'Eau, Ministère de l'Écologie et du Développement durable - Les zones humides et la ressource en eau - Guide technique. - Étude sur l'eau n° 89.

The position and role of wetlands among ecosystems

1. *Agences de l'Eau (2000)*

Their economic functions are equally varied: agricultural production on soils that are very fertile thanks to the alluvia, salt production, plant produce (plankton, reeds, fodder, wood, etc.) and animals (fish, shellfish, birds, etc.). These natural resources contribute to activities such as agriculture, stock rearing, hunting, fishing, plant gathering, shellfish and fish farming, etc. Economically speaking, the value of some intact wetlands, including for water supply, flood prevention, pollution control, leisure and pleasure, would be 150 times greater than if they were to be drained for agriculture[1]. The issues associated with these various types of resource exploitation can lead to competition, highlighting the contradictions involved in making management decisions.

Wetlands fulfil essential functions



Wetlands fulfil essential functions:

- **Hydraulic regulation,**
- **Improvements in water quality,**
- **Support for an ecosystem and a high level of biodiversity**

Source: Agences de l'Eau, Ministère de l'Écologie et du Développement durable - Les zones humides et la ressource en eau. Guide technique. - Étude sur l'eau n° 89.

6. Skinner J., Zalewski S. (1995)

Economic valuation of the Merja Zerga wetland in Morocco[1]

A study to evaluate the total economic value of the site was undertaken, enabling a rough estimate of direct and indirect use values to be drawn up for this lagoon site which, admittedly, is slightly incorrectly described as Mediterranean as it opens onto the Atlantic Ocean.

In this context, the annual net revenue from tangible products of direct use from the Merja Zerga has been estimated as 7,822 DH/yr/household (807 $). This sum includes the use value of tangible products and the value of the unpaid labour of the family. The revenue directly derived from the Merja Zerga may be divided into the following components: fishing 38%, animal produce 34%, club rushes 14%, clams 7%, plant produce 3%, agricultural work 3%. Extrapolating this estimate to include all of the 2464 households that make use of the Merja Zerga, the overall direct use value would be of the order 20 million dirhams per year (2,062,000 $)...

In the case of the Merja Zerga, the intangible products are the products of indirect use, which are difficult to quantify. They include recreation, the beauty of the landscape, and its value as a sanctuary, breeding and stopover site for fish and migratory birds. There is also a value associated with non-use or with options such as biodiversity conservation. This value is estimated using the notion of "Willingness to pay" (WTP) which expresses the willingness of visitors to this wetland to "pay" a certain price towards the conservation of the points of interest and the recreational qualities of the natural environment which they wish to come and visit. This WTP would be estimated as 187 DH (19.3 $) per household. Confining the assessment only to those provinces that accounted for 90% of the sample surveyed (Meknes, Fes, Kenitra, Khemisset, Rabat, Sale and Sidi Kacem), the total willingness to pay would be of the order of 150 million dirhams (15,465,000 $).

Adding together the two values: 20 million dirhams per year and 150 million dirhams assumed to be payable today; a Total Economic Value in today's terms of more than 500 million dirhams (51.55 million $) is obtained, based on a discounting rate of 6%. This figure must be considered as the minimum economic value of the site, as it has been derived only on the basis of a limited population, i.e. the households that live in the areas adjacent to the Merja Zerga.

In reality, the preservation of the Merja Zerga is important not only for the residents of the site, but also for the entire nation and the international community, who benefit directly or indirectly from it or who are involved purely for altruistic reasons...

N. Beck / Tour du Valat

1. Benessaiah N. (1998)

Socio-cultural and heritage values[1]

One of the characteristics shared by all the wetlands that have been studied is the attachment which appears to be felt towards them by the resident communities who derive most of their resources from them. They often have a special socio-cultural relationship with the wetland environment. Even in cases where no historical presence has been demonstrated, as in the Neretva delta in Croatia, these areas, according to the testimony of their inhabitants, constitute a cultural heritage in their own right and a natural heritage which they hope to conserve for future generations.

At Merja Zerga for example, it is undoubtedly the holy man, Moulaye Bou Selham, whose marabout is still viewed as a place of power and blessing, who created the basis for the first human settlements in the Merja.

Finally, they fulfill social and cultural functions, these sites being promoted more and more as places for relaxation, leisure and discovery, given their high degree of landscape quality. But these places are also enjoying an upsurge of interest relating to their heritage legacy.

Wetlands also very often bear witness to a remarkable degree of skill and ability in the social management of their resources, particularly water.

Skills and abilility in collective water management[2]

The Valencia Water Court in Spain, the most ancient legal institution in Europe, is concerned with the management of irrigation water in the *Huerta* of Valencia. The land surrounding the Albufera is irrigated via seven large irrigation channels carrying water from the river Turia. The owners of the fields irrigated by the water, which circulates in the main channel and in subsidiary channels, form a community of irrigators and make use of the water as of common property in proportion to the surface area of the land that is to be watered. The origins of such an institution are likely to date back to Roman times, though some clues point to the influence of Arab culture in its organisation.

When a farmer breaks the rules he must be judged by the tribunal, which meets every day at midday before the doors of the cathedral. The judgement is oral, nothing is written down, and there is no appeal against the decisions of the Valencia Water Court...

1. Benessaiah N. (1998)

2. Viñals M.-J. (2002)

This wide range of different functions is superimposed in a single area, leading to competition and conflicts of interest which may be settled by very diverse methods depending on the management system (disputes between hunting and fishing interests over the management of the salinity of ponds, conflict between hunters and walkers over access to land; farmers-hunters, residents-walkers, etc.).

The figure on opposite page symbolizes the different types of interactions caused by these varied wetland functions. At the interface of the uses generated by these functions, Maltby[1] distinguishes situations of complementarity from those of competition, which may be systematic or more occasional.

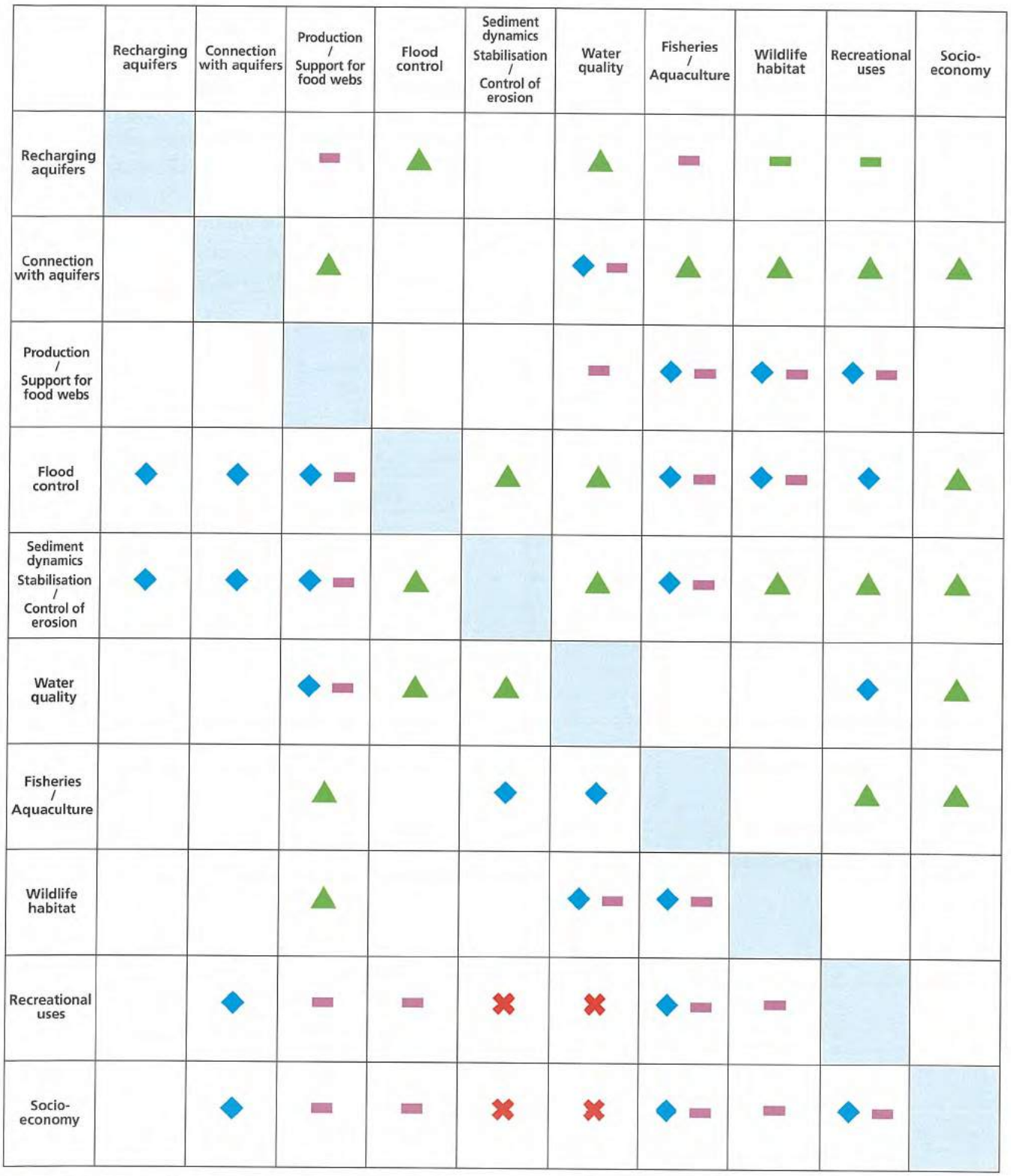
Diversity of social and economic processes in Mediterranean wetlands

The above characteristics present a general picture of Mediterranean wetlands, their resources and the functions that they fulfil for society. But it must be stressed that such a summary draws on a wide variety, so that any generalisation in terms of problems and actions is rendered hazardous and complicated. Any thinking on the subject of management must take into account criteria for differentiation between sites which should not be limited to indicators relating only to the ecosystems. It is important to include in the analysis factors such as the types of use, the influence of economic issues, the types of management organisation, the institutional context within which these organisations exist. It would be worthwhile to undertake an analytical study in this respect, to develop a typology of the socio-economic and institutional contexts which, to a large extent, determine the management of these special areas scattered over some 22 countries. Our intention here is simply to emphasise the differentiation criteria which seem to us to be the most useful for this discussion of the management of Mediterranean wetlands. They relate in particular to five categories derived from the ecological, social and institutional contexts of the management of natural resources:

- differences associated with the climate, which determines the importance of issues relating to the allocation of water resources,
- demographic characteristics, which are very variable between different countries and which result in more or less strong pressures being exerted on these places,
- national institutional and political characteristics, which give rise to systems of management that are more or less open to consultation and the integration of policies,
- the specific history of social and financial management of the places involved, which influences the development of local skills and knowledge and facilitates the involvement of some types of user groups,

1. Maltby, E. (1988)

Interactions between different wetland functions



Source: Maltby E., Hugues R., Newbold C. (1988).

• the very varied perceptions of the heritage value of wetlands by different societies, leading to a greater or lesser degree of support by society for conservation measures.

On the physical level, the common characteristic of the Mediterranean climate is long dry summer season, of variable length, which necessitates a heavy dependence on irrigation. In reality there is a considerable contrast between the North side of the Mediterranean (including Turkey) and the South and South-East. The northern side backs onto temperate regions which bring abundant supplies of water. The southern coasts, on the other hand, are bordered by arid and desert regions and, as a result, have very limited supplies of water.
The ratio of renewable supplies to the demand for water is very variable, as may be seen from the data presented in the following table.

Resources, demand and utilisation of water by different economic sectors (km³ and %)

Country	Renewable resources	Total demand	Urban demand (%)	Industries (%)	Thermal power stations (%)	Agriculture (%)
Spain*	31,1	20	13,5	13	10	75
France*	74	17,2	10	7	69	14
Italy	187	46,35	15	15	1	69
Malta	0,07	0,034	100	-	-	-
Ex-Yugo.*	77,5	1,5	20	67	-	13
Albania	50	2,97	20	2	-	13
Greece	58,5	7	11	2	4	82
Turkey*	63,5	6,7	15	10	-	74
Cyprus	0,9	0,38	11,3	0,3	-	88,4
Syria**	35,1	5,2	6	21	-	73
Lebanon	4,9	0,86	22,5	-	-	75
Israel	1,7	1,9	17	3,5	-	79,5
Egypt***	56,5	59,4	6,5	5,5	-	88
Libya	0	2,62	44	-	-	56
Tunisia	4,35	2,3	10	-	-	90
Algeria	19,1	3	35	6	-	59
Morocco*	30	11	7,5	4,5	-	88

* Within the limits of the Mediterranean Basin,
** Total, including supplies from the Euphrates for Syria and the Atlantic catchment for Morocco,
*** For Egypt, 56.5 km³ corresponds to the allocation currently reserved for Egypt, the natural flow would come to 85 km³.

Source: Margat, J. L'eau dans le Bassin méditerranéen, les fascicules du Plan Bleu, n° 6, Paris Economica, 196, p. 1999.

Analysis of these figures enables four types of situation to be distinguished. In some cases the amount of water available per inhabitant per year may already be reaching a critically low level. Other countries still have more room for manoeuvre in the face of the crucial choices to be made regarding the provision of water.

This raises the question of how much room for manoeuvre there is among the different countries in drawing up and successfully implementing a policy for water provision which reconciles the conversion of wetlands into areas of intensive production and the preservation of wetlands for the conservation of their ecological and social functions.

The Mediterranean eco-region may also be split into two geographical groups defined by contrasting demographic, socio-economic and ecological characteristics. The Mediterranean coast is experiencing exceptional rates of demographic growth; the population could increase from 420 million in 1995 to over 500 million in 2025[1]. This overall growth is of course not uniform. It is greatest in the South and East of the Basin, in countries where there is a young population with a relatively high birth rate combined with a low standard of living and a scarcity of water resources (catchment areas in more or less arid regions). Such an increase in human pressure can only exacerbate the rate of water extraction and the decline of wetlands.

Economic and demographic flux is leading to an increasing gap between the countries on either side of the Mediterranean. In the South, the demographic changes are resulting in increased socio-economic activity, bringing increasingly severe pressures on scarce resources and on increasingly less productive ecosystems (increasing requirements for water for agriculture around towns, problems of industrial pollution and of purification).

Water scarcity in the Mediterranean Basin[2]

Four groups of countries may be distinguished within the Mediterranean basin, according to the natural and renewable water supplies available per inhabitant per year:

- Under 500 m^3, considered to be the threshold of water shortage: Israel, Jordan, Libya, Malta, Palestinian Territories, Tunisia,
- Between 500 and 1,000 m^3, considered to be the threshold for constraint: Algeria, Egypt,
- Between 1,000 and 3,000 m^3, considered to be sufficient resources at the present time: Cyprus, Spain, Lebanon, Morocco, Syria,
- Over 3,000 m^3, considered to be abundant resources: Albania, Bosnia, Croatia, France, Greece, Italy, Slovenia, Turkey.

1. Margat J. (1999)

2. Bâtisse M. (2000)

In the North, the trend is much more stable, even though wetlands are still far from being immune from the consequences of human activities.

These population trends have ecological consequences for the South; there are also social effects. The population decline in the southern Mediterranean rural areas is accompanied by the disintegration of traditional social systems in the coastal towns which are the focus of migratory influxes. The high rate of inflow and the concentration of the populations around the edges of the major urban centers deprive these urban areas of their essential role in the integration of new arrivals. The highest priority for a large majority of the populations living close to the coast is that of survival, leaving very little room for wetland conservation.

There is also great diversity among the actors and institutions involved in the process of managing these places. In the North and the South of the Mediterranean, the institutional contexts of land management are very different; they produce very contrasting modes of organisation depending on the country involved.

Pressures due to population growth acting on Mediterranean wetlands

Demand for water has increased by 60% in 25 years and corresponds to a 60% use for agriculture (84% in the Southern Mediterranean countries), exacerbated by the demands of tourism in summer. Meeting the needs of the next thirty years would require a 40% increase in supplies.
Coastal development is itself under threat from the pressure of tourism: the Mediterranean accounts for one-third of the world's tourism, which has already taken up 4,000 km of coastline. Confronted with such an economic boom, it is more than worrying to consider that, depending on the country, protective measures only affect less than 25% of the coast.
Decline of biodiversity, with the disappearance of 151 coastal species and 77 marine species (from Lacaze, 1993). The scale and number of ecological crises has increased over the course of the last thirty years, as exemplified notably by the production of 100,000 tons of green algae in the Laguna di Orbetello, with a plankton density 1,500 to 7,000 times greater than in the 1970's.

General institutional context of wetland management in France[1]

"Most characteristic from this point of view is the fact that important modifications have been implemented, allowing local authorities to include environmental aspects in their development policies:

- Decentralisation has conferred greater responsibility on local authorities in conducting the development and management of their land. 'Communes' therefore play a central role in the implementation of sectoral policies within the competence of the Ministry of the Environment, since it is at the Commune level where a large number of decisions are taken concerning the surroundings and living conditions of the population. The effectiveness of these decisions is often going to depend on the consistency of interrelations which may be established between the various different parts of the territory (intercommunality) when interests are shared.

- The Departmental and Regional territorial authorities are seeing their responsibilities progressively increasing in the environmental sphere; though the legal responsibilities of the Conseil Général regarding the environment remain limited, its contractual responsibilities (water, waste disposal, infrastructure/landscape, etc.) are constantly growing. Both the Conseil Général and the Conseil Régional oversee the harmonious development of the Camargue in the Gard Department and have an overall responsibility for environmental matters, as laid down in recent laws (relating to Waste Disposal, Water, Quarrying, Landscape, etc.)."

- Environmental policies are becoming increasingly separated from strictly sectoral approaches to tackling land use development as a whole; in addition, concerns relating to quality of life, in which the everyday environment takes a central position, are high on the agenda for many authorities.

- The population is having greater expectations regarding the environment both at the global scale and also in respect of the local and day-to-day environment. While environmental problems have recently taken on a global dimension, populations are also increasingly insistent on putting the local issues under the spot light. The management of the environment and improvements in the quality of life are achieved by bringing about a consistent environment policy, within the local geographic and institutional context, which allows for the participation of the population."

Urban growth: "tailing off" in the North, "astronomical" in the South and East[2]

In the year 2000 over 64% of the population of the 22 countries bordering the Mediterranean lived in towns. In 2025, this level of urbanisation of the whole region could increase to 72% (trend-based scenario).

- In the countries of the North (Spain to Greece) the level of urbanisation will only increase very slightly over 25 years, from 67% to 69%. The populations of the large urban areas will increase from 129 million in 2000 to 135 million in 2025, while the urban population of coastal regions will remain practically stable.
- In the countries of the South and East (Morocco to Turkey) despite a major decrease in the rate of population growth, the rate of urbanisation will increase from almost 62% to 74%. Large urban areas will increase from 145 million inhabitants in 2000 to 243 million in 2025, including over 30 million additional urban dwellers in the large urban areas along the coasts.

1. SECA (1993)

2. Margat J. (1999)

General institutional context of rural development in Tunisia[1]

1. The major stages in the history of rural development in Tunisia

Over the course of the last fifty years, the country has experienced a succession of approaches to development:

- 1956-1972: regional programmes to combat unemployment, (major environmental protection works and tree planting intended to provide anti-erosion and infrastructure programmes for poor rural dwellers).

- 1973-1984: the period of regional development programmes intended to develop a basic infrastructure, diversify and strengthen agricultural activities and improve the living conditions of the rural masses (global development programmes in some regions).

- 1987-1992: following the implementation of the Structural Adjustment Programme, the withdrawal of the State from the management of the hydraulic infrastructures of drinking water and irrigation, in favour of communities, was confirmed by the creation of "Associations d'Intérêt Collectif" (political and legal framework for basic organisations in rural areas).

- 1984-1989: integrated rural development programmes. These were intended to include the various spheres involved in community development (concentration of activities in selected zones and combining infrastructure with the promotion of agriculture). The preservation of natural resources and the environment had a stronger presence, alongside the objective of improving the living conditions of the population.

- 1990-2000: participative and integrated development programmes. The preceding approaches did not succeed in stimulating any real process of self-development among the target populations. The hopes invested in raising their awareness of the problems of the protection of the environment were also severely dashed. These lessons led therefore to the very widespread adoption of the concept of the participative approach.

- 2002: the participative approach reassessed and the beginnings of more decentralised approaches to development. Willingness emerged to go further along the path of support for basic initiatives and of decentralisation of the management of natural resources. The reform of institutions was also carried out with reference to the local development which is the culmination of the process of integration of regional issues. It is a matter of urgency that a global vision be developed involving locally-based land use management that enables communities to become involved in concertation proceedings with rural, local and regional councils.

2. Policy of the Tunisian Government regarding concertation and participation

The recent restructuring of government departments (Ministries of the Interior and of Local Development as well as the Ministry of Development and International Cooperation and the Ministry of Agriculture, Environment and Water Resources) reveals the willingness of the State to strengthen the institutional basis for appropriate local development by local actors. It should be noted that within this framework, the objectives of the State are centred on the achievement of three priority goals[2]:

- long-term consolidation of development;
- support for economic reforms that tend to reinforce competitivity and to promote full employment;
- support for new initiatives to strengthen local institutions, open new areas of development and attract external finances.

However this overall development of the concept of regional development programmes

1. Bonnet B., Medimegh A. (2003)

2. Tunisian Republic. Co-operative Strategy. World Bank. 2000-2002 projections.

presupposes corresponding changes in the legal and administrative contexts. They involve firstly the initiation of regional and local concertation with local organisations. Secondly, they entail funding for the decentralisation, which raises the question of the development of a rural tax system. A suite of reforms in progress aims to strengthen the framework for concertation and cooperation among political representative authorities, both regional (Regional Councils) and local (Local Development Councils and Rural Councils which are destined to see a strengthening of their roles and their prerogatives). These reforms have the objective of strengthening the strategic role of the regions and consultative bodies in the planning of regional and local development. These responsibilities cover in particular the choice of areas of involvement for projects and the integration of the idea of local development as a new concept which will transcend the separation of town from country. They are also concerned with support for development bodies and institutions and for basic organisations within the framework of local and regional concertation.

In the South of the Mediterranean, consideration of the environment and involvement of the population in conservation has taken very varied routes, as is illustrated by the history of orientations in rural development policy in Tunisia: (see box on opposite page).

Studying the links betweenactors and users involved with wetlands necessarily takes place in the light of the history of resource exploitation and of the social and physical management of the sites. The history of development and the legacy of methods of land management have forged rights and usages which should be analysed very carefully. Their impact on current modes of wetland management is considerable. Most wetlands have been developed in order to enable various preferred uses to take place (agriculture, fishing, grazing, etc.). The management of the developments carried out depends on the organisation of specific user groups such as agricultural irrigation organisations, hunting and fishing clubs – which are key actors in the management of these areas.
Strongly linked with the history of local land use, the contrast between land management systems between the North and South of the Mediterranean is still very great. The Nile Delta is widely dominated by family-based land holdings, extremely fragmented and generally below the economically sustainable threshold of half a hectare per family, as shown in the box on following page.

In contrast, the Camargue is dominated by large landed estates of several hundred hectares run by private owners or industrial companies who are involved in the large-scale irrigated production of cereals[1]. The distribution of rice fields, which were at first indispensable for removing the salt from soils intended for viticulture, has varied in agrarian history according to the developments carried out, but especially according to the state of the European and international agricultural economy.

1. Mathevet R., Mouret J.-C., Mesléard F. (2002)

Perceptions of the heritage value of wetlands by local societies are in addition very variable. On the sociological level, the perception of the value of wetland conservation has changed significantly, depending on the country concerned. In France, for example, these places were considered for a long time to be unhealthy areas to be sanitised by means of drainage, mosquito control and development.

Social history of land use in Egyptian wetlands and present implications for integrated management

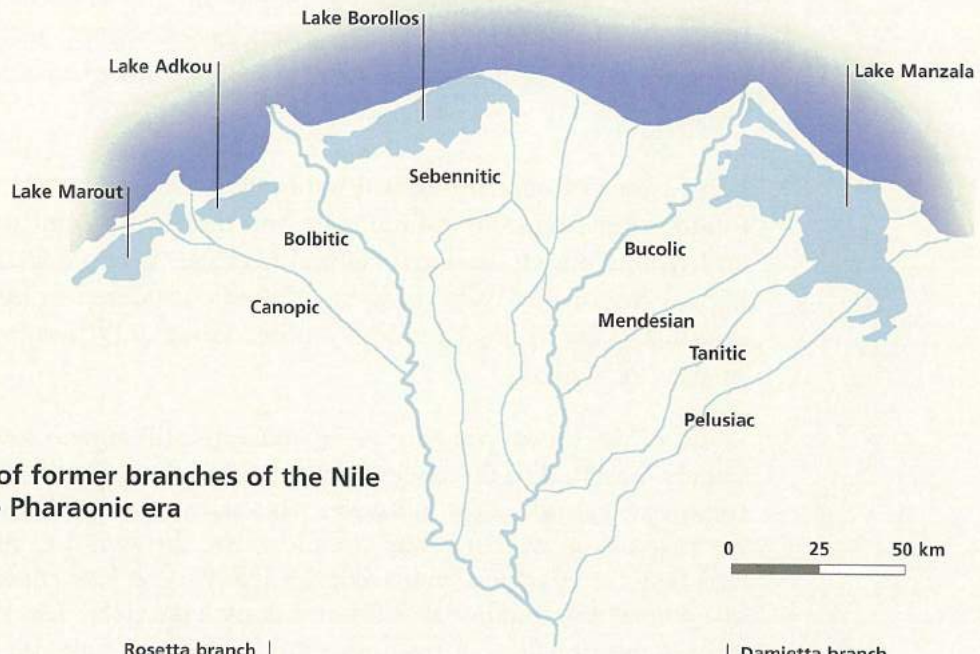
The Agrarian Reform undertaken by Nasser in Egypt involved some 818,000 feddans (343,000 ha.), i.e. 13% of the usable agricultural area, amassed by expropriation of landowners in possession of more than 50 feddans. This land was distributed, in parcels averaging 1,1 ha. to 342,000 families of tenants or agricultural workers who were working on the large expropriated farms, i.e. 20% of the 1.6 million farms counted in 1961. This process of redistribution slightly improved the lot of these people, without however affecting that of the seasonal agricultural workers, or tarahils, who were excluded from the Agrarian Reform's distribution process. This is why the Agrarian Reform had a particular effect in the regions with large estates, especially around the delta, where in the 19th century the land was granted to large companies or individuals to be improved. In the Centre and the South of the Delta, where small scale farming predominated, it only had a very limited impact...

Owing to the intensification of farming methods promoted by the State after Nasser (general implementation of two crops per year, massive use of inputs, increases in the volumes of irrigation water and selection of the highest-yielding seeds), the farmers of the delta have on average been able to support their families on two feddans, or less than one hectare...

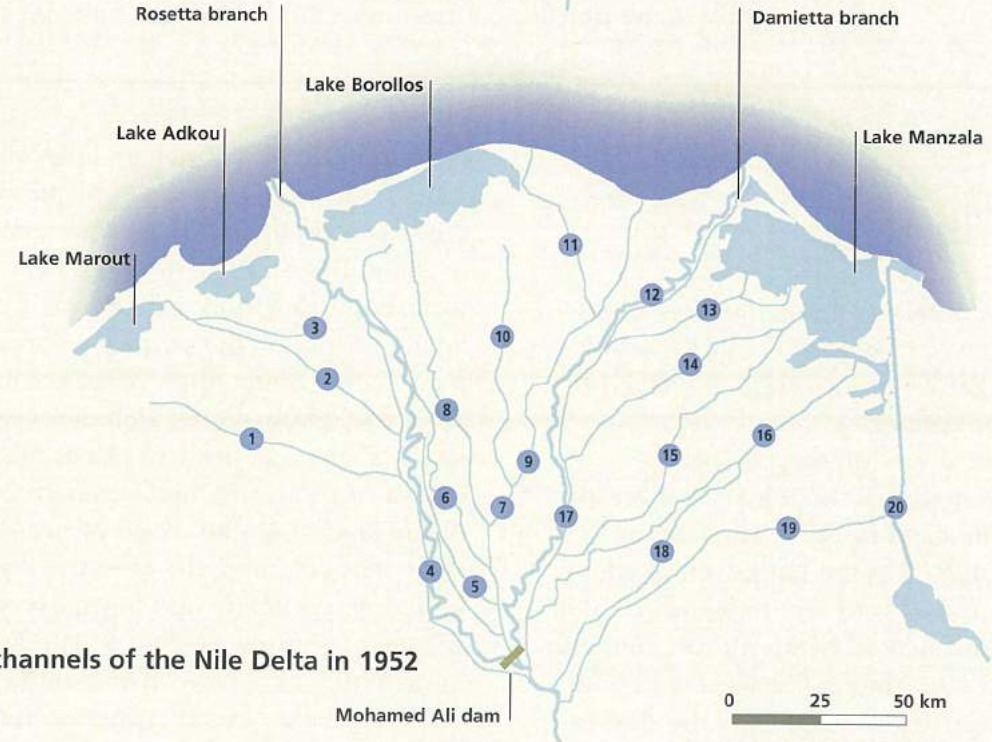
"The selective agricultural policy implemented in the 1970's has nevertheless not led to a major reconstruction of agriculture in which only the economically viable farms have survived. It has led to aberrant situations in which some of the smallest farms are surviving, unprofitable farms are succeeding. These aberrations result from a combination of the two factors of family solidarity and external revenues, which are having the effect of upsetting the mechanisms of production and accumulation in Egyptian farming."[1]

1. Sainte-Marie C. (n.d.)

History of developments in the Nile Delta



Locations of former branches of the Nile during the Pharaonic era



Principal channels of the Nile Delta in 1952

1. Noubareyya channel - 2. El-Khandouq channel - 3. Mahmoudeyya channel - 4. Rayah el-Baer - 5. El-Pharaoneyya channel
6. El-Bagoureyya channel - 7. Rayah el-Ménouleyya - 8. El-Qasad channel - 9. Bahr Cherbine - 10. Gaoufreyya channel - 11. Rayah el-Belqas
12. El-Mansoureyya channel - 13. Bahr el-Saghir - 14. Bahr el-Buhiya - 15. Bahr el-Mouise - 16. Bahr el-Faqous - 17. Taoufeqeyya channel
18. Bahr el-Baqar - 19. Ismaïleyya channel - 20. Suez channel

Source: Les échanges entre les villes du delta, ORSTOM-FURP, Le Caire, 1989. CAO: FI, TROIN, URBAMA (1996).

It should be noted however that for a number of recent years this very negative predominant attitude to wetlands would have been changing. Society has been giving increasing recognition to the essential ecological functions that they fulfil. The impact of the recent floods in France would likely have influenced society and highlighted in particular the importance of the crucial hydrological role played by wetlands.

Expressions of almost mystical impressions of these areas can also be found, glorifying their natural state and their wild character... Poets and writers enrich the local cultural heritage. Ways of life that were kept secret or that up to now have been considered to be marginal are thus being appreciated and are becoming attractive from the point of view of society.

South of the Mediterranean, these concerns still appear to be very widely confined to the background, behind the pressures of urbanisation and industrialization. This does not imply that the cultural heritage of the wetlands has been lost. Are the symbols, myths, rituals and beliefs associated with wetlands likely to be less important than elsewhere? Do traditional skills and knowledge have less of a part to play in the practices of resource exploitation that have been passed

A poetic view of wetlands from 1990[1]

"I chose the smallest, the lightest boat, one of these flimsy crafts which bear the name here of «négafols» or «noiefous». I wanted to discover the spring.
It was there. It was on the lagoon, a murmuring. It was made of lives and breaths, but too tenuous to be sure. Terns were flying very high. On the banks, the reeds of the marsh rustled with tiny movements. My cheeks were caressed by an air too gentle to ruffle the water. Among the weeds, I could make out the shoals of fish and the flashes of white as the bream turned aside. For a long time I watched the bed of the lagoon where the blades of the oars were reflected.
It was then that, for the first time,
I understood the connectedness of things, this kind of cohesion which links all the different parts of the world. At the bottom of the water, on the mud, brown creepers were twisting. But on their stems greener marks were appearing, and the form of a bud was taking shape; on the pernicious crust, petals were half-opening; there were colours there, aureoles, silky patterns, delicate designs, subtle shades. In this lost place, this deserted corner of the world, and beneath the surface of the lagoon, in the world of miasmas, there was colour, there were the laws of harmony, symmetry and form, everything that had been revealed to people since time immemorial by what convention has called Art and Beauty; but in such a secret way that it seemed to be kept for the world of seaweeds, for the glaucous stare of the eel, for the larvae, for the dingy shellfish, translating the need for splendour in these brackish places."

1. Baissette G. (1990)

Changes in the views of society concerning wetlands in France[1]

The development option of the 1970's: continuing the conquest of "stagnant waters" begun at the dawn of the 20th century: infilling of marshes and increasing irrigation.

It is a particular example of the expansion of the agricultural ecosystem which introduces us to the theme of the importance of water and of the long history of its harnessing and use as a fertilising agent.

Examination of the Cassini map[2] gives an idea of the vast expanses of land which, at the end of the Ancien Régime, was given over to marshland. Far from being confined to the plains of the Lower Rhone, they can be seen to have extended through valleys and basins, alongside the smallest stream struggling to find its way across the plain. It is a sign of the limits which still existed at this time to the human conquest of nature. In no French Department was there more land still remaining to be won from the stagnant waters at the turn of the 20th century than in the Bouches du Rhône; Villeneuve's "La Statistique" give an estimate of 47,000 hectares. Around 1830, only 16% of the area of the Camargue was considered to be usable land: this was the land of extensive horse and sheep raising, saline scrublands where the presence of sand and salt prevented the growing of crops. The Durance and the Rhone reigned over vast areas of marshland: "Floods often used to overrun the whole of the lower plain and after their retreat they would leave the land transformed right up to its edges; islands would have moved from one place to another, some becoming joined onto the terra firma, while whole areas that had always been linked to the "mainland" of the local communities would reappear as unstable islands."[3]

However, no matter how far back one may go in time, one will find signs of the attempts made by people to overcome this naturally hostile element. Here we recall the famous Fossa Mariana from the Roman era, designed it is true for purposes of waterborne transport rather than drainage. The first limited attempts at draining the land, the embankment of watercourses and the associated practice of irrigated cultivation may be dated to the early Middle Ages. The development of channels and réals in the outskirts of Avignon, Châteaurenard and Cavaillon (St Julien Canal) has been shown to have taken place from the medieval period, and the same work had already been accomplished in the valleys of the Argens, the Nartuby and the Huveaune: we will return later to the actions of the inhabitants of Cuges in the 15th century to clear up the marshes which extended over the plain and were impeding the villagers' "explorations" in their search for new land.

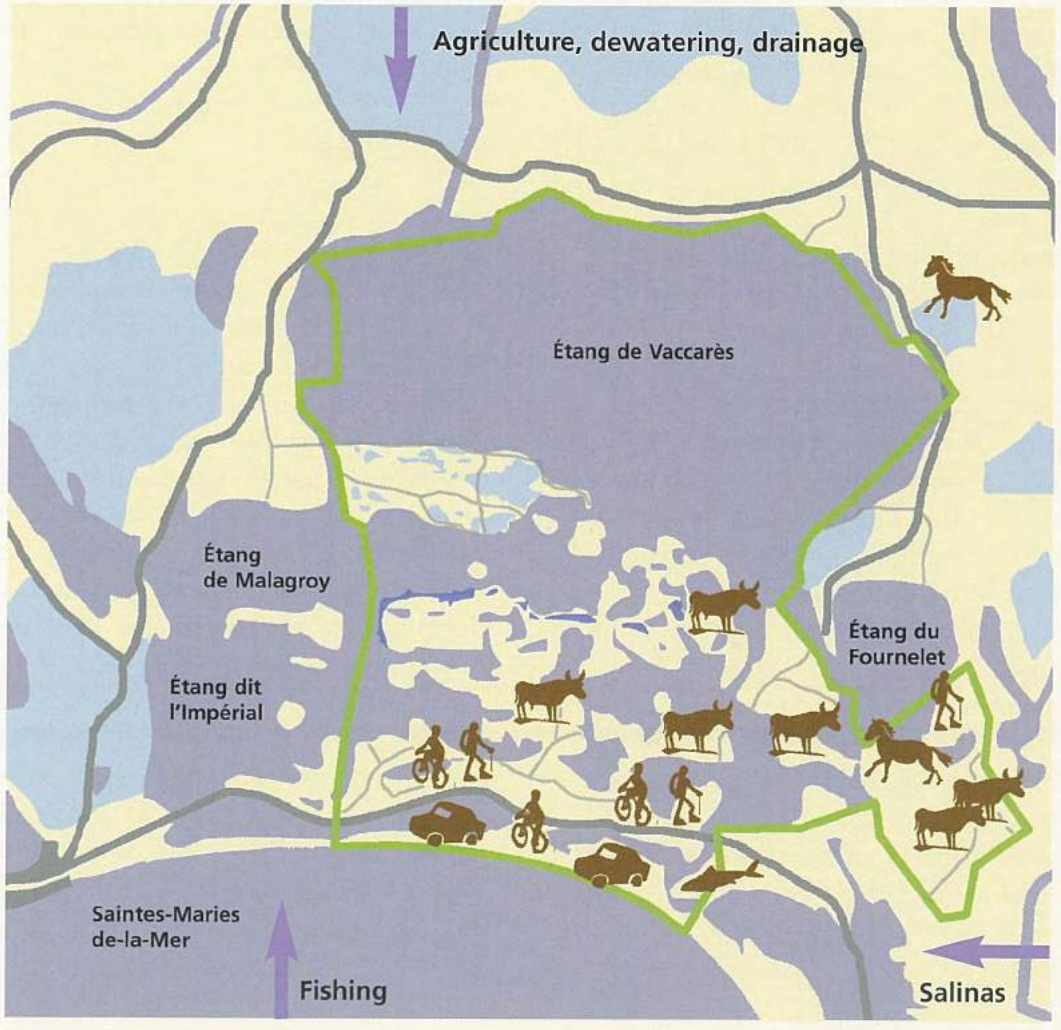
1. Amouretti M.-C. (1977)
2. Map of France established by Cassini in the 18th century
3. Faucher D. (1927)

down by generations of fishermen or farmers? There is no doubt at all that the cultural heritage of these Southern wetlands is still very much alive[1], but no doubt also that society accords it little significance today.

The Ramsar Convention, concerned about this situation, strongly emphasises the necessity for promoting a greater consideration for the cultural heritage of wetlands. It is making it into one of the most important levers for achieving the preservation of the wetlands.

The diversity of human pressures being exerted on wetlands

Map showing trends induced by man on the reserve



Source: Plan de gestion 1996-2000 de la Réserve nationale de Camargue, Société nationale de protection de la nature, in Gestion des milieux naturels, plan de gestion des réserves naturelles, ATEN, Ministère de l'Aménagement du Territoire et de l'Environnement, 1998, 96 p.

1. Viñals M.-J. (2002)

Conservation issues affecting these wetlands

Threats to their future and their biodiversity

The Mediterranean countries have lost between 50 and 70% of their wetlands during the course of the 20th century[1]. In spite of the efforts being undertaken, and awareness of the environmental and social costs of this process, the rate of decline in wetlands amounts to about 1% per year. For example, Italian wetlands have declined from over 3 million hectares during the Roman era to 190,000 hectares today. Tunisia has lost 28% of its wetlands over the last hundred years. Spain has lost 60% of the area of its natural wetland, largely during the last four decades[2].

In the context of the Red List, the IUCN and Bird Life International estimate that between 8 and 12% of bird species will be threatened with extinction over the next hundred years. The study of fossils enables the natural extinction rate to be estimated as approximately one bird species every 100 years. Over the last 200 years, the extinction rate for birds has been forty times greater.

This severe reduction affecting Mediterranean wetland ecosystems has direct consequences for biodiversity. It is estimated that, on a global scale, several thousand species and many ecosystems disappear every year, and at a rate never before attained in history[3]. Precise figures are not available for all Mediterranean wetlands, but a few examples will give an idea of the severity of the biodiversity impoverishment taking place. Data of some ten years ago point out that only 27% of endemic freshwater fish were not considered threatened[4]. With their habitats under threat, 38% of all European bird species have undergone declines in numbers and/or geographical ranges over the course of the 1970's and 1980's[5].

The issue of the conservation of the few remaining wetlands around the Mediterranean is all the more important as competition over access to water and resources become ever more rapacious.

More generally, Mediterranean wetlands are subject to a number of threats which are the direct consequences of development and the overexploitation of their resources (water, pasture, fish, etc.)[6]. But wetlands are also affected by human activities which take place more widely in the catchment areas on which they depend (water supply and pollution).

Overexploitation of the natural resources of Mediterranean wetlands causes damage to three resources in particular: the fish, the vegetation and the fauna which depends on it, the birds.

Overintensive fishing and the use of prohibited fishing methods reduce the density and diversity of fish. This trend towards

1. Hecker N., Tomas Vives, P. (1995)
2. Skinner J., Zalewski S. (1995)
3. IUCN and Bird Life International (Red List)
4. Maitland P. S., Crivelli A. J. (1996)
5. Tucker G.M., Health M.F. (1994)
6. Martino P., Portillo A., Odriozola J. (2002)

Pressures and uses causing reductions in biodiversity[1]

The Etang de Vaccarès in the Camargue (France)

At the Vaccarès, professional fishing is still practiced on private lands located around the eastern, northern and western shores, as well as at the Etang des Impériaux. This activity constitutes a management constraint: surveillance of boundaries, hydraulic management.

Accordingly, as each category of users of the Vaccarès system has particular requirements in terms of water levels and salinity (farmers: low levels, low salinity; fishermen: high levels, medium salinity, etc.), consensus is practically impossible to achieve. Also, the overall interest for nature conservation is currently not taken into account in water management, priority being given to the individual interests of the Camargue farmers and other economic users outside the National Reserve.

Within the Camargue Regional Natural Park, two committees ("Agriculture" and "Hunting, Fishing and Nature Protection") attempt to reconcile these differing wishes. In practice, water levels are at present mainly managed by the farmers (who are also the managers of private hunting grounds), the fishermen becoming involved from time to time under certain conditions. The input of fresh water into the Vaccarès is under the control of associations, made up of farmers, who operate the drainage channels (Fumemorte, Rousty, Sigoulette); communications with the sea are controlled by the Syndicat de la Digue à la Mer, which is itself also largely composed of farmers.

The availability of fresh irrigation water for the inhabitants of the river/lake system in the reserve is severely restricted during the period when the rice fields are flooded (March to July – it is precisely at this season when the demands are greatest); all the more so since the reserve lands affected are located at the end of the distribution network.

Hunting takes place from 15th August to the end of January around the edge of the Camargue reserve, both on Communal lands (Arnavon, Digue à la Mer) and private land (land surrounding the Vaccarès, land belonging to the Salins du Midi et de l'Est Company), and (severely) disturbs the birds on adjacent land, inside the Reserve (marshes of Salin de Badon, Vaccarès, Mornès, Digue à la Mer, etc.).

Tour du Valat

1. Réserves Naturelles de France (1998)

overexploitation is occurring in the Nile delta in Egypt, along the Odiel in Spain, the Po delta in Italy, the lagoons of Albania.

Uncontrolled grazing causes a reduction in the vegetation and in the diversity of the associated fauna. For example Ichkeul in Tunisia, where, due to the lack of appropriate legislation and under the pressure of an increasing human population, the wetland has been subjected to the growth of unrestrained grazing and an increase in stocking density over the course of recent decades. The main cause of overgrazing is associated with the development of stock-tending agreements between local farmers and the urban owners of the livestock. Elsewhere, as in the floodplain of the Ebro in Spain, the growth of agriculture and the implementation of anti-flooding measures have had a very negative effect on biodiversity and the vegetation of the riverbanks..

Excessive hunting pressure and mass tourism cause reductions in the density and diversity of waterbirds. This may be observed in the wetlands of the Odiel in Spain and the Camargue in France, where hunting affects not only the hunted species but also other species through the disturbance that it causes, thereby reducing the sizes of wintering populations.

Reduction of the surface area of wetlands for developments (e/g/ conversion to agriculture, industrial exploitation of salt). The fertility of alluvial soils and the availability of water create very high pressures on these wetlands for agricultural use.
The establishment of intensive farming within Mediterranean wetlands often involves drainage and the use of artificial fertilizers and pesticides with particularly harmful effects on wildlife. The Nile, Po and Ebro deltas are particularly good examples of the redevelopment of wetlands to create agricultural land that is now subject to intensive farming using artificial products.

The threats acting on the larger scale of the catchment area are just as harmful as those acting directly within the wetlands. Due to the lack of any long-term planning for sustainable development or of a regional development strategy that takes wetlands into account, population growth within the Mediterranean basin is resulting everywhere in an upsurge of agriculture, industry and urban activity in the whole catchment area.

Extraction of water from further upstream, for the purposes of irrigation, may cause hydrological imbalances: In the South of the Mediterranean, dams constructed in the upper reaches of the wetland catchments bring about a downstream decrease in the supply of fresh water. These developments, planned to meet the increasing demands

for irrigation in the Maghreb, fundamentally alter the distribution of the water resources within the catchment area. They raise the question of the decisions to be made regarding the allocation of water resources: difficult decisions which have to balance economic and food requirements on one side against biodiversity conservation on the other.

The effects of the construction of dams for the purpose of widespread irrigation of the delta land can be spectacular, and this forces a reappraisal of the productive potential of the land. The following Box illustrates this for the particular case of the Nile Delta and the consequences of the Aswan Dam, which was constructed with the aim of providing permanent irrigation.

Urbanisation and urban pressures are severely reducing the areas of wetlands. This is due to population density in these coastal areas, pressures from the adjoining towns, and attractiveness of the coast to property developers. The expansion of settlements immediately around these wetlands has irreversible consequences in terms of land

Effects of irrigation on the lands of the Nile Delta in Egypt[1]

Until the advent of permanent irrigation, the delta used to benefit from alluvia brought down by floodwaters thanks to the system of hods[2], whose purpose was to trap the floodwaters and the silt brought down by the river...

With the establishment of permanent irrigation during the last century, the risk of salinisation of soils in the surrounding areas has increased as a result of the poor drainage. The clay soils, saturated with water, at present have surface horizons containing up to 30% salt. They are difficult to drain, the areas concerned being situated practically at sea level, which excludes any possibility of gravity-induced drainage. In these very low-lying areas, which are subject to rises in the water table, drainage is really only effective if it is carried out by pumping.

Now that the alluvia in the floodwaters no longer spread out over the mouths of the river, an imbalance arises between the marine and river environments. The build-up of alluvia at the mouths of the Nile and its channels used to provide a defence against coastal erosion. Before the Aswan High Dam was built, the annual mass of silt carried in by the river, measured at Cairo, used to amount to 57 million tonnes per year; these days it is only 2.1 million tons per year[3]. Owing to the retention of the greater part of the silt at the level of the dam, the Nile no longer brings in enough solid material to counteract the force of the sea currents. As a result, at the mouths of the two branches of the river, erosion has done nothing but accelerate since the flooding of the Aswan High Dam.

1. Fanchette S. (1997)
2. Irrigation basin
3. Béthemont J. (1988)

Loss of wetlands through drainage and water abstraction for agriculture[1]

Spain, Algeria, Tunisia, Egypt, Turkey

The greatest threat which Mediterranean wetlands have to face is that of alterations to their hydrology associated with drainage and with the extraction of water for irrigation. In Spain for example, world-famous sites such as the Tablas de Daimiel and the Coto Doñana, which are numbered among the most important wetlands in Western Europe, are in the grip of serious and rapid changes in their hydrological regimes. In the case of the Coto Doñana, water is extracted from the Almonte aquifer to grow strawberries from March onwards for the European market.

South of the Mediterranean, the pace of change is slower, but is accelerating along the same lines. The important El Kala wetlands complex in Algeria is under threat from the proposed Mexanna dam. This will deprive Lake Oubiera of water and will probably cause Gara and El Makhada to dry up. The intensification of traditional fishing and of hunting at El Kala, and increasing pressure from fishing at Lake Oubiera and Lake Mellah, are seriously disrupting the breeding of the wildlife populations. Hunting pressure is high at Tonga and Oubiera and particularly intense at Gara and El Mekhada, despite National Park status.

The same situation can be observed at Lake Ichkeul in Tunisia, as at the Akrotiri salt lake in Cyprus. The situation is particularly alarming at Ichkeul, where significant changes in the vegetation have been noticed as a result of increasing salinity and alterations to flooding levels. If a management plan is not being implemented very soon, the exceptional ecological heritage of this wetland will be lost. In the Gulf of Gabès, also in Tunisia, waste water disposal is causing pollution and the disappearance of habitats. Heavy metal pollution from local industry is being detected, and the Es Skhirs refinery is a major culprit in this respect.

All these problems, exacerbated by eutrophication and the illegal exploitation of resources, are displayed to a very serious extent at two important Egyptian wetlands: Lake Idku and the Burullus Lagoon.

In Turkey, Camalti Tuzlasi is also threatened by plans to expand the salt industry, and the future of the Goksu Delta is being brought into question by the increase in tourism in the region. The lack of any control over hunting is a recurrent problem at most sites.

These examples of the crucial problems which confront the major Mediterranean wetlands may unfortunately be expanded on. They demonstrate the urgency of the need to implement effective protective measures for the remaining wetlands of the Mediterranean basin. Carefully-monitored development programmes are required, and more effective regulatory measures are essential for the protection of these places. The enforcement of existing rules and regulations is undeniably a crucial first step in this direction, but it will not succeed without a far more determined political commitment and support than has been provided in the past.

1. WB/EIB (1995)

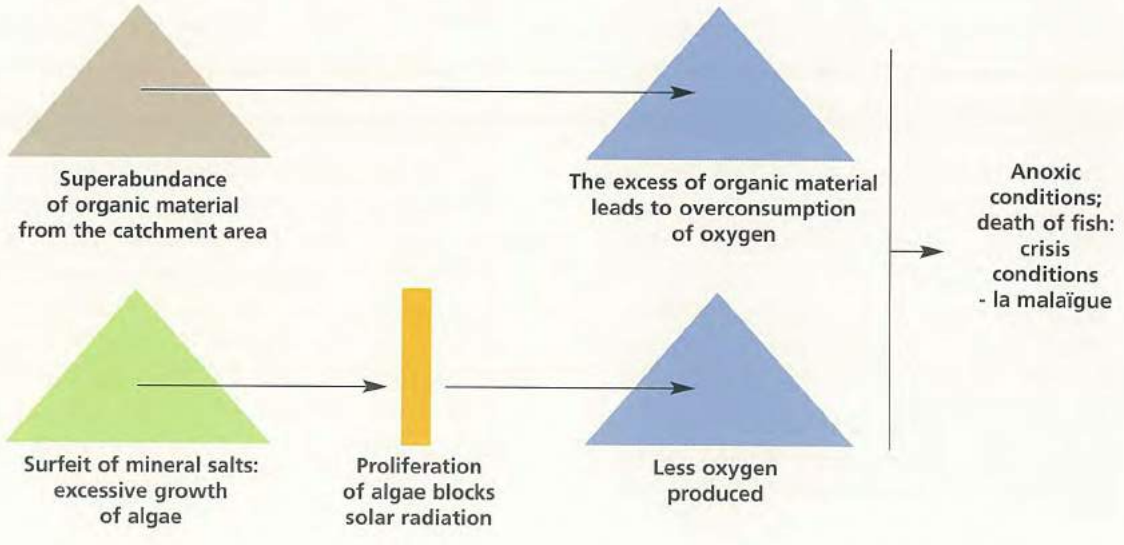
use and the resulting major effects that are not easily compatible with conservation.

Various types of pollution, linked with the disposal of waste from domestic, agricultural, industrial and tourism activities, are causing severe declines in water quality. As they mostly drain densely populated areas, the watercourses that feed the wetlands often serve as outlets for waste water that has been treated more or less thoroughly depending on the country or area. Two types of pollution may be distinguished: eutrophication or pollution by organic material, associated with the disposal of domestic and industrial waste water and agricultural fertilisers, and chemical pollution associated with industry and the use of agricultural pesticides.

The "malaïgue" phenomenon

The Etang de l'Or and the Bassin de Thau (France)[1]

Urban and industrial pollution, as well as the diffuse pollution generated by the use of agricultural fertilisers and pesticides, constitute a major threat for these ecosystems. This pollution, which occurs over the whole catchment area, results in an excess of organic material, nitrates and phosphates, leading to what is known locally as the "malaïgue" ("bad water") and resulting in the asphyxiation of fish and shellfish.



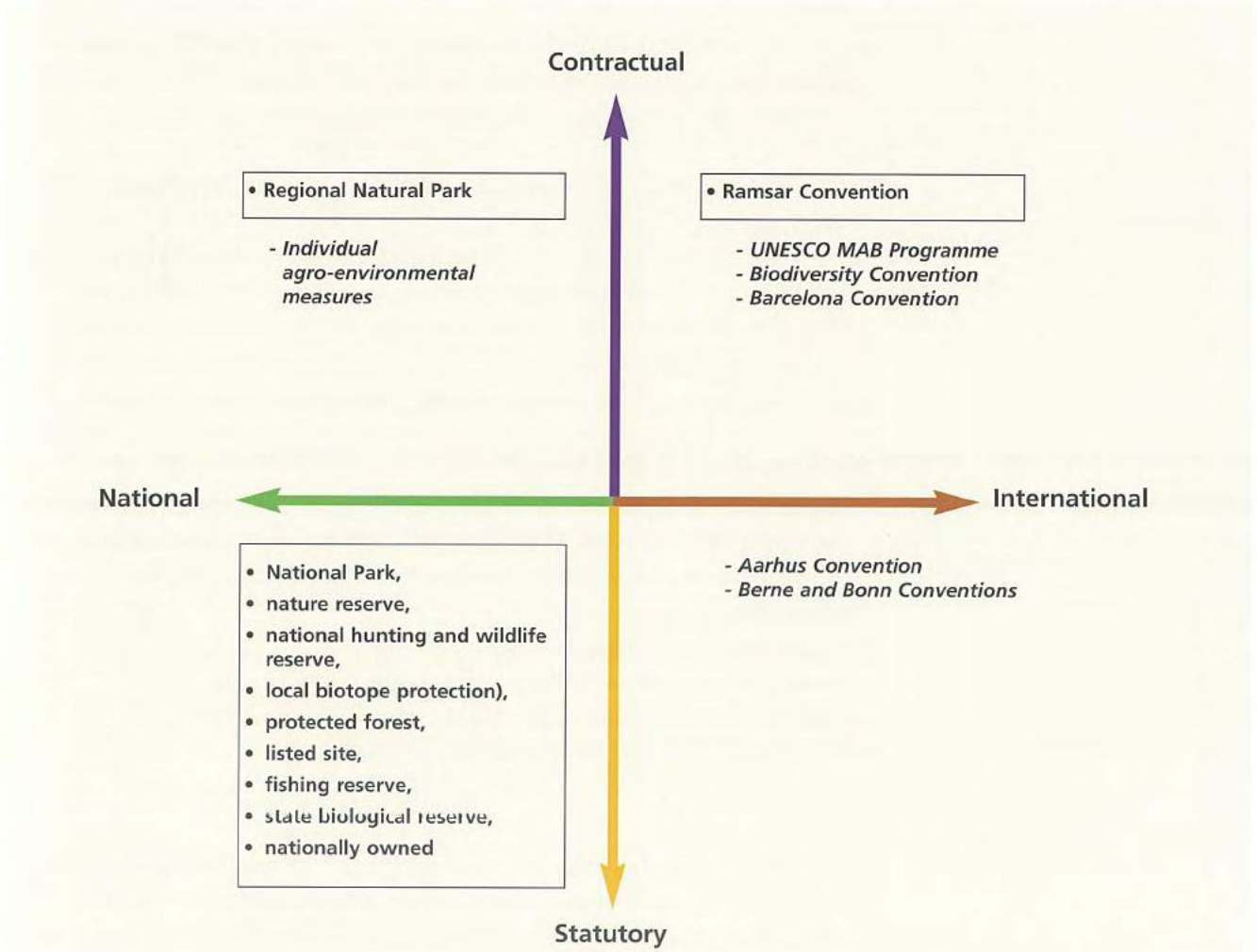
Source: Syndicat mixte de gestion de l'Étang de l'Or (1997).

1. Syndicat mixte de gestion de l'étang de l'Or (1997)

2. Eutrophication : algal bloom which happens in waters overloaded with nutrients or in heavily degraded rivers.

These various processes of wetland degradation that are directly or indirectly linked to human activities can only become more pronounced over the coming years. In spite of a certain increase in awareness, particularly through the MedWet initiative, the hoped-for impacts are not yet sufficiently perceptible or effective to assume that these resources will be saved. This is all the more worrying in that the climatic changes forecast for the coming decades are sure to radically aggravate these problems. Some scenarios, still the subject of contradictory arguments, predict an increase of 1 to 3.5 °C between now and 2100, accompanied by a rise in sea level of between 15 and 95 cm[1]. Such changes could lead to massive flooding, widespread severe salinisation of Mediterranean wetlands and the loss of most of their hydrological and ecological functions.

In Europe, a wide range of protective measures are designed to ensure the protection of these sensitive and ecologically important areas



1. *Watson T. R. (2001)*

Regulatory measures for the protection of wetlands

Faced with the issues outlined above, protective measures and regulations for use in the conservation of wetlands vary widely from site to site. They may derive from different levels of decision-making (national or international) and may take different forms (legal restrictions or incentives). Some countries are well-served within framework policies for the protection of natural areas (in particular France, Italy and Spain). Others are much less well-equipped in this sphere (in particular the southern coast of the Mediterranean where decentralised authorities are either much more recent (as in Morocco) or still emerging (as in Tunisia).

The previous figure attempts to summarise the range of protective measures. This may be broken down into a more detailed classification which divides the measures into six groups according to criteria relating to their origins and the framework in which they are applied, and from statutory to contractual.

More specifically, it is useful to present in a more explicit way three major types of regulation which may be implemented with a view to promoting the conservation of Mediterranean wetlands:

• Regulatory and restrictive measures that may be implemented by Governments

In France, nature reserves may be created[1] *"on part(s) of the land of one or more Communes, when the conservation of the fauna, the flora, the soil, the water, the mineral deposits or the fossils, or the natural environment in general, is of particular importance and merits protection from any potentially damaging human activity."*

The Act of 10 July 1976 lists the objectives to be taken into account in creating a nature reserve:

– preservation of endangered species,
– regeneration of animal or plant populations or of their habitats,
– preservation of botanical gardens, biotopes and geological formations,
– preservation of migratory stopover sites,
– need for scientific studies of the natural environment,
– preservation of sites of particular interest in the study of the evolution of life and early human activities.

A nature reserve benefits from a specific set of regulations in relation to these protection objectives[2]. Certain activities that may be harmful to the optimal development of the fauna and flora, or may alter the characteristics of the nature reserve, are thus forbidden or strictly controlled. The management structure comprises two levels.

1. This discussion will be restricted to public nature reserves, as the case of private reserves conforms with a different management structure.

2. Desfossez P., Vanderbecken A. (1994)

The range of protective measures in France

	Designation	Legal context
Protection relating to statutory obligations	– Protective measures provided for by the coastal law – Protective measures provided for by the water laws – Protective measures provided for by fishing laws – Prefectoral bylaws for the Conservation of Biotopes – Natural sites and monuments	Costal Law 1986 Decree March 1993, water law Fishing law Act of 10 July 1976 Act of 2 May 1930
Protection within the framework of land management structures physical planning bodies	– National Parks – Nature reserves – Voluntary nature reserves – State-owned and forest biological reserves – National hunting reserves and national fishing reserves – Regional natural parks	Decree March 1993 Act of July 1976 Rural Code, Inter-Ministerial Agreements 1981 and 1986 Rural Code Decree March 1967 and "landscape" law 1993
Protection through advisory and planning tools	– Natural zones of ecological, faunistic and floristic interest (ZNIEFF) – ND Zones of Land Use Plans – Regional Programme for Water Planning and Management and Programme for Water Planning Management	Circular 1991 Urban Development Code Water Law 1992
Protection by way of incentive and contractual measures	– Rural land management funds – Agro-environmental measures – LIFE Financial Aid instrument for the Environment Programme - Natura 2000 Programme: - Special Protection Areas - Special Areas for Conservation	Physical Planning Guidance 1995 European Regulations 1992 EC Regulations 1992 Birds Directive 1979 Habitats Directive 1992
Protection through land and use controls	– Conservatoire of the coastal environment and lake shores – Regional Conservatoires for Natural Areas (CREN) – Foundations – Sociétés d'Aménagement Foncier et d'Etablissement Rural (SAFER- Non-profit making land management and rural development companies) – Sensitive Natural Areas (Département) – Convention for the Management of State-owned sites – Rural conventions and leases	Law 1975 Associations Law 1901 Patronage Law 1987 1960 and 1990 Laws Rural Code Law 1985 State-owned Land Code Rural Code
Protection resulting from international obligations	– Wetlands – Protected areas and biodiversity – Biosphere Reserves – Council of Europe biogenic reserves – World Heritage Sites for their natural value to Humanity – Wildlife and natural environment – Conservation of wild migratory species	Ramsar Convention, 1971 Barcelona Convention 1972 UNESCO-ONU Action Plan 1974 European Network 1976 Paris Convention 1976 Berne Convention 1979 Bonn Convention 1990 AEWA Agreement

The consultative management committee is chaired by the Prefect and includes representatives of the local authorities involved, site owners and users, the administrative bodies and public agencies affected, scientists, nature protection associations. The reserve manager is nominated by agreement with the Prefect; management may be the responsibility of an Association or NGO (of the 1901 Law type), a Commune, a group of Communes, a public body or an owner. The responsibilities of the manager include the implementation of the practical details defined in the founding Decree and overseeing the upkeep and wardening of the Reserve, scientific monitoring and, if included in the management objectives, public access.

The measures subject to national control may be supported by international agreements (treaties, conventions) to which States sign up (with indirect regulatory powers). Once ratified or approved and transferred to the national level, they are integrated into the internal legal machinery and take on an authority superior to that of national laws. The State is then obliged to implement the undertakings agreed to, and to take the necessary measures, not necessarily directly regulatory in scope, to ensure that they are put into effect. In this context, the Ramsar Convention and the Aewa Agreement are examples of an international desire to implement a conservation strategy for wetlands and migratory birds.

The International Ramsar Convention for the conservation of internationally important wetlands was signed in Iran in 1971. Initially focused on wetlands as bird habitats, it has been ratified by 138 countries. Today 1,314 sites are included on the Ramsar list, covering a total area of 111,031,197 hectare[1]. These wetlands acquire a new status on the national level. In the eyes of the international community, they are of importance not only for their own countries but for the whole world. Each country is committed to producing a national strategic plan for the conservation of their wetlands. On the other hand, the inclusion of a site on the Ramsar list does not lead to any direct regulatory effects. It does not make available any resources capable of facilitating the implementation of conservation measures. For this reason, Ramsar is often viewed simply as a label, alongside the statutory tools that are applicable in some countries, such as France. Nevertheless, as emphasised by Lutz and Mondain-Monval[2], the inclusion of a site on the Ramsar list may help society to come to appreciate its value. Consequently, this designation does lead to action for conservation, to a reduction of threats, to the participation of local people in management. The Ramsar Convention has the advantage of generating tools to guide and direct the work of government services, NGOs and others involved. The Convention Bureau publishes guidelines dealing with various issues, both technical (production of management plans) and methodological

1. RAMSAR (2003)

2. Lutz M., Mondain-Monval J.-Y. (2003)

(involvement of local actors), that are useful to the managers of the wetlands in question. This last theme of conservation/participation is a key point for integrated management, an aspect to which the Ramsar Convention has provided an important contribution in terms of methodological ideas.

The Barcelona Convention, established in 1976 and amended in 1995, has the objective of protecting the Mediterranean marine environment and coastal regions. Twenty States from around the Mediterranean, as well as the European Community, are signatories. The aim of the 7 protocols drawn up within the framework of this Convention is in general to prevent any deterioration in the environment, and more specifically to prevent and to combat various types of pollution. The objective of the protocol relating to specially protected areas and the biological diversity of the Mediterranean (SPA Protocol) is to preserve marine biodiversity and threatened or endangered animal and plant species through the identification and management of specially protected areas. Of interest also is the new Protocol currently being developed for integrated coastal area management.

The objective of the African-Eurasian Migratory Waterbird Agreement, Aewa, is to improve international cooperation regarding the conservation and study of migratory waterbirds. This agreement is the most important aspect of the Bonn Convention (Convention on the conservation of migratory wildlife). The agreement came into force on 1st November 1999. 35 countries have signed up to it. The wording of the agreement as such sets out the principles, legal framework and clauses, while the action plan describes the conservation actions to be undertaken in different fields (conservation of species and habitats, management of human activities, research, monitoring, education, awareness raising, etc.). The strong point of this agreement[1] lies in its philosophy of enabling a continuous re-evaluation of the conservation status of species and populations to take place, in the light of new scientific studies.

In its Regional Natural Parks (PNR), France provides an interesting example of local control based on contractual measures and widespread cooperation with communities and civil society on a local scale[2]. Starting from the relatively confrontational experiences of the French National Parks, the PNR wished from the outset to convince local communities of the necessity to protect the natural areas within their territory: "to protect, it is first of all necessary to convince. This is the longest and hardest method, but it is also the soundest, the most democratic and the worthiest."
After 35 years of experience, "with no powers to compel but with a duty to convince", the 40 French Regional Natural Parks have developed a unique management system which strives to create

1. Lutz M., Mondain-Monval J.-Y. (2003)

2. Fédération des Parcs Naturels Régionaux de France (2003)

In France, the PNR represent over 10% of the land area.

a force for the promotion and protection of the natural heritage by way of economic and social development.. The Regional Natural Parks of France are distinguished from other protected areas by six characteristics[1]:

- Their territories, rural and inhabited, are recognised at the national level for their high heritage value (natural and cultural) and landscape quality. Their precise demarcation is based on these values and on their consistency (geographical, issues, etc).

- The objective of the PNR is to protect and promote the natural, cultural and human heritage of their territory by implementing environmentally friendly policies for physical, economic, social and cultural development.

Their official missions are: protection and management of the natural and cultural heritage, economic and social development, public access, education and information, and experimentation.

- The Initiative originates with local parties involved with the area (and not with the State), and are taken up by the Region.

- The territorial plan is drawn up at each stage (from joint diagnosis to implementation) on the basis of the widest possible co-operation among the parties involved. The agreement between local authorities and other partners deriving from this plan is formalised in a contract: the Charter. As well as the undertakings for the next 10 years which it contains, its essential aspect is the publicly formalised binding commitment and, consequently, the dynamic process which it initiates.

- The resources and methods of PNR management are the responsibility of a Syndicat Mixte which brings together the local territorial bodies. All the objectives of the Charter, which has no statutory powers, must be achieved on a voluntary basis and through contractual agreements. Each partner must contribute to the implementation of the project within the framework of the existing normal statutory tools (on the national and local levels).

- The role of the State is limited to the designation of the park, supervision and that of a technical partner. Through the Environment Ministry, it validates the contents of the Charter and organises the designation of the Park by inter-ministerial decree. The decentralised services of the ministries directly affected by this Charter (Environment, Agriculture, Town Planning, etc.) are then invited to take part in the working groups and to contribute to the implementation of the Charter according to a general Convention signed together with the Park.

1. They are classified as Category V protected areas (IUCN), but the 40 French PNR in fact cover the management of sites in Categories I to IV, classified at the world or national level: 4 Biosphere Reserves (out of a total of 8 in France), 2 World Heritage Sites, 8 Ramsar sites (out of 18) and about thirty Nature Reserves.

There are also other types of contractual measures intended to influence land use practices on private land so as to promote improved wetland management. Examples include the European Agro-environmental Measures illustrated by the following account.

Contractualisation of farming practices in Spain

Agro-environmental Measures in the Aiguamolls de l'Emporda Park

The Aiguamolls de l'Emporda Park is a 4,700 hectare coastal wetland located on a major bird migration route, between the deltas of the Ebro and the Rhone. This wetland covers a relatively small area but nevertheless supports a multitude of habitats of which some are of EC importance. The coastal zone of the Park is subjected to marine influences, creating extremely rich brackish habitats, with a mixture of lagoon habitats, areas of vegetated dunes and saltwater habitats which provide exceptional sites for thousands of waterbirds.

The interior flat areas are less influenced by maritime conditions and consist of flood meadows and freshwater marshes. These very extensive areas are subject to intensive agriculture which makes use of the area's aquifers. There is also tourism, in the form of camp sites along the coastline.

From the beginning of 1998 a series of Agro-environmental Measures has been tested with the farmers of the Natural Park. By means of financial incentives, farming systems compatible with environmental conservation have been promoted, such as the flood meadows for example. The introduction of these measures was greeted with suspicion during the first year by a proportion of the farmers, but the second stage achieved wider success. This becomes all the more significant when it is realised that the total subsidy awarded was considerably less than the amount available from European cereal-growing subsidies.

The Natural Park therefore succeeded in becoming directly involved in the management of the private lands which account for 80% of its total area. On the other hand, these subsidies are limited to a 5-year period, and the Park's management and the farming organisations have been unable to extend these measures for the time being.

Sergio Romero de Tejada
Aiguamolls de l'Emporda Natural Park

Marie-Antoinette Diaz
Marc Lutz
Station Biologique de la Tour du Valat

Issues and challenges for the conservation of Mediterranean wetlands

To complete this analysis of the resources and also the threats which are causing the conservation of Mediterranean wetlands to be reappraised, we focus on eight specific, fundamental issues that need to be taken into account when developing a viable conservation policy for these areas:

- Halting the decline of wetland biodiversity: the effects of the management and conservation measures taken thus far by public authorities are insufficient to stem the rate at which species and extremely fragile, complex and interdependent habitats are being lost.

- Recognising and promoting the special cultural and historic heritage of wetlands: the history of practice and resource use in these areas introduces a social and cultural dimension that is decisive for the assimilation and long-term viability of the conservation process.

- Including the environmental aspect as a priority in regard to the allocation of water resources: in particular on the southern side of the Mediterranean, for example in Tunisia where the problem is about arbitration between water uses. The conservation of wetlands particularly depends on effectively taking the water needs of the areas into account when prioritising the allocation of water on the national scale.

- Promoting the effective involvement of States in international strategies for the conservation of public environmental assets: beyond the international commitments ratified within the framework of the various Conventions, it is necessary to make sure that the States become genuinely involved in fulfilling these commitments in the places concerned.

- Reconciling the needs of agricultural production with ecology, short term food issues with long-term conservation, the struggle against poverty with environmental concerns. It is legitimate that the agronomic potential associated with the water and alluvial soils characteristic of Mediterranean wetlands should enable the development of agricultural production. This is particularly important for the southern side of the Mediterranean, which is suffering from acute aridification and food insecurity. Wetlands generate a multiplicity of local activities (small-scale agriculture, fishing, stock-rearing, plant gathering) that contribute to meeting the vital needs of health, security and well-being for the local populations. The issue therefore is to succeed in reconciling this range of activities with the

A-ROCHA Lebanon

Invertebrates and seed sampling in Aamiq wetland (Lebanon)

management measures that are vital for the preservation of resources and biodiversity in the long term.

• Favouring local management of common resources and minimising the risks of enclosure and privatisation of wetlands: this implies facing up to the danger of individual appropriation while preserving the multi-use role of these areas, which comes within the ambit of collective law.

• Creating local conservation and management processes for global public property: one of the major issues of integrated management is to rationalise and simplify on a local level the approaches promoted by the international agreements to which States are committed.

• Improving the scientific knowledge to elaborate decision-making tools that can be used by management bodies. Scientific knowledge is very limited compared with the diversity and complexity of these habitats. A research-action process, "adaptive management", is required to enable the impact and effectiveness of the management measures to be assessed. It is necessary to identify indicators and derive operational monitoring methods to inform decision-making and strategies according to the observed results (e.g. salt concentrations in the Camargue, as well as the level of pollution, have a direct influence on the income of the fisherman).

Tour du Valat

Integrated management: evolution of concepts

The concept of integrated management is deeply rooted in the experience gained from the conservation of protected areas, but is also fed by ideas emanating from visions of sustainable development on the local scale. Integrated management includes a number of aspects to be taken into account and its significance today lies in presenting the problem of conservation within the framework of a broader approach to physical planning and development that involves local communities.

Wetlands and ecotourism, Hondo de Elche, Spain

Evolution of concepts: from nature conservation to sustainable development

The integrated management approach makes reference to two key concepts, conservation, the older of the two, and sustainable development, which has emerged more recently.

From conservation ...

The term conservation today encompasses a wide range of concepts. It has undergone very profound changes over the course of the last century. At present, and in particular in the Anglo-Saxon world, the term conservation designates a wise and reasoned management of natural resources, i.e. the use of nature in accordance with an explicit aim of protection in order to ensure continuing use into the future[1]. Conversely, preservation does not permit any exploitation; it entails the complete protection of the areas in question.
The historical analysis of the evolution of the concept of conservation carried out by Rodary, Castellanet and Rossi[1] very perceptively demonstrates three major stages which we will attempt to summarise here in order to better highlight the varied facets of the central concept.

The first stage is that of "failed integration"

The initial ecological concerns appear to have taken on at a very early stage an "integrative" dimension, in the sense that they were expressed through the realisation of the interconnectedness of environmental phenomena and through the formulation of the concept of the scarcity of natural resources. Integration was viewed as a particular dimension but nevertheless a challenging aspect of the exploitation of natural areas. But this vision found itself marginalized and placed in a position of opposition to the objectives of making use of the environment. The "preservationists" were opposed to the "conservationists", leading to the debates that troubled the United States in the second half of the 19th century[2]. The first form of the modern attitude to nature, known as "resourcism", was to be imposed as a central element of modern industry. It derived initially from the issues relating to the finiteness of natural resources, but involved transforming the environment to ensure its better management and to avoid shortages. This accords with the concept of patrimonialism in the French administration of waters and forests, according to which it was the responsibility of the State to ensure the management of

1. Rodary E, Castellanet C., Rossi G. (2003)

2. Marsh G. P. (1964)

natural resources in the long term, as opposed to the short-term interests of various parties involved[1]. The second form, called "preservationism" by American authors, broke away from concerns relating to the human development of Nature to devote itself solely to its protection. Sensitive to the devastation wrought by modern society on landscapes and species, it laid claim to an ethical dimension that would sometimes take on radical forms, the defence of Nature being placed on the same level as the defence of human rights by some fundamentalists. It is through this route that the end of the 19th century saw the creation of a conservation sector and the spread of natural protected areas. These constituted an alternative to the commercial exploitation of natural resources.

"The imposition of natural protected areas": second stage of conservation

There was a widespread proliferation of natural protected areas on a global scale during the 20th century. A significant acceleration in this process took place from 1950 onwards, so that by today they cover over 18.8 million km^2, or almost 12% of the world's total land area[2]. Another characteristic of this stage is that the last century saw the "conservation" of Nature establish itself as a "sector" within society, with its professional bodies, issues, standards, specific spheres of activity and above all its own particular tool, that of the natural protected area. This takes a wide variety of forms, but there is always one fundamental characteristic: the wish to control and/or restrict human activities within the area in question. Expressed in a fairly simplistic way, the basic hypothesis of conservation is that it is possible to avoid the exploitation of natural areas thanks to

Tour du Valat

Sign boards at Camargue National Reserve (France)

1. Ollagnon H. (1989)
2. IUCN (2003)

protection, the creation of "sanctuaries" and "putting them under wraps". It was thought that human activities were leading inexorably to a decline in biodiversity because they tend to simplify ecosystems by favouring the species which are most useful to society. A society would in general tend to modify the environment profoundly before changing its techniques of exploitation. Such an analysis therefore justified the maintenance of sanctuaries, to be completely protected from human activities. A corollary of this has been that the conservation sector (and especially professionals concerned by these activities) has found itself in opposition to the rest of the population. During the course of the 20th century, conservation based on the protected area concept usually had no positive links or objectives in common with development. In addition, this approach has been applied on the basis of the phytosociological concept of the "climax" and the so-called state of equilibrium of natural environments.
In being completely protected from any outside intervention, the habitats in these natural places underwent gradual changes, sometimes to the extent that the original reason for their protection became lost[1]. Thus the result was a failure to conserve the ecosystems, as their spatial and temporal dynamics could no longer function. In general, the restriction or absence of management of these protected areas enabled the approaches to be revised and ecosystems to be considered as being in a "state of permanent imbalance"[2].

"The emergence of integrated conservation": third stage of conservation

The wish of conservationists to separate themselves permanently from society has been called into question since the start of the 1970's. The paradigm shift within ecological science itself, from climax to permanent imbalance, as well as the development of "systematic" ecology, were significant influences here. However the concept change also took place under pressure from two major external changes. The influence of the environmental revolution which began in the 1960's in Western society has been particularly influential in this change. But social criticism is no longer a stranger to it; it has called directly into question the practices of spatial and State-controlled conservation.
From 1972 onwards, the development of studies of the effects of conservation on local communities has resulted in much social criticism of protected areas. The exclusion of populations, whether from the social point of view or from that of land and economics, has been denounced by the anthropologists. It led in some cases to tragic consequences for local communities[3].

1. Babin D. et al. (2001)
2. Potvin C. (1997)
3. Turnbull C. (1972)

Integrated management: evolution of concepts

At the same time, the emergence of many environmental groups has had a certain impact in the conservation world, particularly in the realisation of the connection between economic thinking and ecological processes. The Stockholm Conference on the human environment (1972) included the environment as a question of international policy for the first time. The concept of "ecodevelopment" was used on the fringes of the meeting, to be replaced a few years later by the more consensual term, "sustainable development"[1]. This was also the time when the international community realised for the first time that there are "limits to growth" and that all peoples are living on the same planet, and are threatened with extinction unless common rules can be adopted to restrict the consumption of certain scarce resources, prevent the build-up of toxic waste and ensure the continued functioning of our supply and survival systems. Under the aegis of UNESCO, 1974 saw the emergence of the concept of the Biosphere Reserve" *(Man and the Biosphere)*[2]. These regulated areas, based on a spatial sequence of at least three levels of protection, have had the purpose of linking the needs of conservation with the demands of development. The movement, launched with the World Conservation Strategy, gained ground steadily throughout the 1980's. From the start of the 1990's it has been formalised in the "integrated programmes for conservation and development (ICDP)", which have themselves subsequently been partly supplemented by community-based management of natural resources[3].

Management categories for protected areas as defined by the IUCN[4]

- Complete protection: protected areas managed mainly for science or the protection of wilderness (Ia: Strict Nature Reserve / Ib Wilderness Area).
- Conservation of ecosystems and tourism: these are protected areas managed mainly for ecosystem protection and recreational purposes (National Park).
- Conservation of natural features: these protected areas are managed mainly for the conservation of specific natural features (Natural Monument).
- Conservation by means of active management measures: protected areas managed mainly for conservation, but subject to active intervention for management purposes (Habitat/Species Management Area).
- Conservation of landscapes and seascapes: these are protected areas managed mainly with the aim of conserving landscapes or seascapes and for recreation purposes.
- Sustainable use of natural ecosystems: protected areas managed mainly for the sustainable use of the managed ecosystem resources (Managed Resource Protected Area).

1. Sachs I. (1994)
2. IUCN, PNUE, WWF. (1980)
3. IIED (1994)
4. IUCN (1994)

Participative approaches have marked a fundamental turning point, in expressing the wish of the professionals to include within their policies the populations directly affected by conservation actions. After many years of "exclusion" conservation, "socialised" conservation has now arrived[1]. It is now the process of inclusion that is predominant.
The objective is to create the conditions for the local re-appropriation of the management of species and areas. In this sense, one may speak of "integrated conservation", understood not as a process of appropriation of land (National Parks and reserves are themselves appropriated by certain parties), but as a process of uniting sectoral conservation with other forms of exploitation of natural resources. What is being sought is the overcoming of the spatial confrontation between development activities (agriculture, forestry, etc.) and the preservation of natural resources. It is therefore necessary to enable and create spatial continuity in resource management, in which conservation is interlinked with other modes of resource utilisation and management; an interlinking that manifests itself in political legitimacy within the social group concerned.

Finally in this history of the evolution of the concept of conservation, it is worth more specifically recalling a widely recognised definition of the conservation of wetlands. It emerged from the discussions which underpinned the drawing up of the International Ramsar Convention: "the rational use of a wetland and of its resources designates any mode of managing this habitat that enables social and economic activities (hunting, fishing, agriculture, salt production, silviculture, boat transport, leisure, some industries) to be reconciled, while maintaining the balances of the area in question, in other words while conserving its ecological characteristics. Only continuous cooperation between the different categories of users and beneficiaries of the wetland will enable such an objective to be achieved. This is the reason for the creation of a monitoring committee for every Ramsar site, in order to direct and coordinate the management of the wetland and to respect its ecological integrity"[2].

...to sustainable development

The lessons learned from the experiences summarised above have shown clearly that the issue has been to pose the problem of conservation in the context of a broader approach to planning, with a strong emphasis on the development of land and the involvement of local communities. It has involved a concern to integrate more effectively the social, economic and environmental aspects of development into measures for the conservation of natural resources.

1. Rodary E. et al., op. cit.

2. The Ramsar Convention Secretariat, leaflet (nd)

An overview of the evolution of conservation[1]

Conservation/protection of particular species

The first measures which may be described as "conservation" appeared in response to the realisation that some animals were becoming scarce, especially more spectacular ones such as the elephant, the rhinoceros and the ostrich. South Africa, often cited these days as one of the most successful of African countries in preserving its wildlife, was the country where it was most threatened at the very beginning of the 20th century. To prevent the extinction of species, it was necessary to take conservation measures. The first legislative measures related to the banning of killing or capturing certain animal species.

The conservation of ecosystems

It quickly became apparent that the measures relating to the survival of animals were fairly unproductive if their living habitat was not also protected. The second stage was therefore to protect the specific habitat of certain animal species. In this way the first National Parks, reserves and sanctuaries were created. For Africa, a boost was provided in 1993 by the London Convention known as the "Convention on the Conservation of Wildlife and Natural Habitats". The measures were adopted and developed by the Algiers Convention in 1968 (African Convention for the Conservation of Nature and Natural Resources").

The next step was to progress to the conservation of special, fragile and threatened ecosystems such as wetlands or tropical forests. This change was signalled by the Ramsar Convention (1971) relating to wetlands and the World Heritage Convention (1972; the part relating to the natural heritage).

Man's place within ecosystems: the conservation of the biosphere

Among the lessons learned from the experiences of establishing protected areas, the question of reconciling conservation with the sustainable use of resources very quickly arose. It appeared that the aims of conservation could be pursued all the more effectively if they were based firstly on research, monitoring and education, and secondly on the cooperation and commitment of the local communities affected. The Biosphere Conference organised by UNESCO in 1968 marked an important stage in the evolution of the concept of conservation. It was the first at the intergovernmental level to seek compatibility between conservation and the use of natural resources, thereby anticipating the concept of sustainable development.

"Reservations about reservations": management and sustainable development

Completely protected areas generally represent a small area of territory while in the rest (by far the greater part) no conservation measures are taken. This has led to "reservations about reservations" and to a consideration of the pernicious effects of a certain form of conservation. It is in this way that the concept of sustainable management for ordinary areas has emerged. This concept was one of the themes of the Rio Convention (1992).. It is an aspect of "ecological correctness". It is now very widespread. However it may be noted that there are more mentions in reports or in the minutes of meetings than there are corresponding actions in the field..

1. Rodary et al., op. cit.

It involves "reconciling the local and the global, Nature as a resource and Nature as a system, the short timescale of immediate needs and the long timescale of generations"[1]. Closely linked with biodiversity conservation, the concept of sustainable development was launched in 1980 by the IUCN, sanctioned in 1987 in the Brundtland Report, expanded at Rio de Janeiro in 1992 and included in the same year in the Maastricht Treaty. Sustainable development is "that which meets the needs of the present without compromising the ability of future generations to meet their own needs[2]". This concept is established as the political affirmation of the possibility of reconciliation between the objectives of socio-economic development and the conservation of the natural heritage. It involves four key aspects:

- The multidimensionality of environmental problems,
- The irreversibility of ecological damage,
- Equity between rich and poor, North and South, and present and future generations,
- Uncertainty about the causes and consequences of environmental threats.

Accordingly, the purpose of this concept is to create a global welfare society that provides all its people with effective access to all human rights – political, civic and civil, economic (starting with the right to decent work), social and cultural, and what are known as collective rights, to development and to the environment, to the town, to children[3]. As stressed by Sachs[4], this society must be based on a "sustaining economy" a Gandhian concept which contrasts with the notion of the "predatory economy", or on the construction of "a civilisation where life is sustained by the sharing of assets"[5] through living in harmony with nature.
The importance attached to taking account of the future, and in particular the medium and long-term future, without doubt constitutes one of the main characteristics of the concept of Sustainable Development. This sustainability includes several aspects[6]:

- Ecology: "when the modes of development of natural resources allow the preservation of the existing potential, its renewal or even its improvement".
- Techniques: when they "(old and new) are suited to the needs and to the economic and social conditions of the producers".
- Economy: when needs are satisfied, incomes secured and well-being improved.
- Social: when society is capable of taking control over its future.
- Institutions: when they can ensure gains without causing difficulties for the future.

1. Sachs I. (2002)
2. Brundtland G. H. (1987)
3. Lang P. (2002)
4. Op. cit.
5. Lebret J. (2000)
6. FAO (1995)

Lessons and constraints specific to the management of wetlands and coastal areas

The varied experiences in the field of wetland protection have revealed a certain number of constraints and difficulties which have stimulated the thinking about the approaches of integrated management.

This range of constraints, reiterated here, relate to eight factors which emphasise the insufficient decentralisation of institutions and political power in favour of wider involvement among the societies involved:

- Fragmentation of the management and decision making processes,
- Insufficient attention paid to social and economic history,
- Lack of connection between environmental research and decision making,
- Discrepancy between international debates and local management,
- Lack of any appropriate institutions for sustainable development,
- Focus of democratic processes on the short-term,
- Questioning of the role of the State,
- Insufficient degree of input from communities in the conservation process.

Over-fragmented management and decision-making processes

Studies reveal that mechanisms for taking action are disjointed, leading to a scattering and lack of targeting of financial aid, the aim of which has most often been to respond to short-term demands, relegating the fundamental issues of the conservation and sustenance of ecosystems to the level of minor concerns[1]. Political and administrative structures at different levels appear to be unsuitable for the management of ecosystems, which has to carefully balance biological and economic factors[2]. The existing institutional and legal context is therefore called into question, particularly in view of the geographical and sectoral fragmentation of competence exerted on these areas. The combined effects of administrative decentralisation of competence and market liberalisation have resulted in the splitting up and fragmentation of management and decision-making processes.

1. Peyrefitte M. (2000)

2. Kalaora B., Charles L. (2000)

Insufficient attention paid to social and economic history and traditional knowledge

It has been recognised that human societies, because of the knowledge that they have of the places to be protected and their ancestral skills in exploiting these environments, cannot be ignored. Studies are therefore focussed on questions of access to the land and of social psychology, which opens the door to potential conflicts between statutory legitimacy and lawfulness as understood by the actors. The social and economic history of wetlands plays a key role in the management of these places. It has been recognised as a major challenge for improving the effectiveness of decisions aimed at conservation. In this context, the Biodiversity Convention has brought about a significant increase in awareness in relation to the accelerating destruction of traditional knowledge systems[1]. Article 8 (j) points out the link between the erosion of biological diversity and of cultural diversity. The conservation of the *modus vivendi* of indigenous populations and local communities is recognised to be a way of preserving biological diversity, as the indigenous and local communities have a very strong connection with Nature and their history is closely linked to that of the land on which they live. While the primary purpose of traditional knowledge is to regulate links within the community and the connections between the community and its environment, Article 8 (j) links traditional knowledge with the concept of innovation and of practical activity. Traditional knowledge is perceived as a useful resource for sustainable development and hence for the conservation of biodiversity. The recognition of the innovative potential of traditional knowledge and practices opens the door to protection by way of Intellectual Property Rights.

A lack of social and instrumental research in favour of the decentralised management of natural resources

The importance of a greater coherence between science and political decisions has been strongly highlighted[2]. It is evident that in France, in particular, research for the benefit of local managers is sparse, and is the work of management professionals and not of universities. The sphere of social engineering remains poorly developed when it could promote the observation of behaviour and could support the development of suitable responses to environmental problems and to legitimate or unjustified aspirations. While the environment constitutes a sector that lends itself particularly well to social experimentation, experiments with the aim of engineering social interactions and creating learning systems for environmental purposes are practically non-existent. The responsibility for this deficiency is attributed to the centralised character of the State and to its remoteness from general

1. SOLAGRAL (2000)

2. Kalaora B. (1998)

society. Also implicated are the practices of researchers, who would prefer the "centre" to the "margins" while gaining "more symbolic benefits from the analysis of expertise situations than the practical study of everyday behaviour"[1].
This lack of connection between research and political decision making highlights what is sometimes known as "the black hole of expertise between science and decision making"[2]. Increasingly preoccupied with the threats facing the global environment, public opinion and governments rely on specialists to provide diagnoses for use in support of actions. But it is difficult to put the knowledge of researchers into practice for decision making. In the case of climate change, which was first described as long ago as 1897[3], too many decades elapsed before the commitments of the Kyoto Protocol of December 1997 were undertaken[4]. The experts have long seemed to be concerned with matters of form and entertain a debate among themselves without reaching out to the decision makers. On the more limited scale of wetland conservation, this issue of informing the

Article 8 (j) of the Convention on Biological Diversity (1992)

"Each contracting party shall, as far as possible and as appropriate: subject to national legislation, respect, preserve and maintain the knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity, and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices."

Indigenous and local communities (rural peoples for example) have a very wide knowledge of the biodiversity which surrounds them and have introduced specific innovations and practices for its management. The concept of "traditional knowledge" includes theoretical knowledge, innovations and practices. The fruit of experience built up over centuries and adapted to the environment and to local culture, traditional knowledge is transmitted orally from one generation to another. This is a collective heritage which manifests itself in a wide range of forms: stories, songs, folklore, proverbs, cultural values, beliefs, rituals, customary rights, language, agricultural practices, including the raising of plant and animal species. Traditional culture is essentially one of practical activity, especially in spheres such as agriculture, fishing, health, medicine, horticulture and forestry.

1. Kalaora B., op. cit.
2. Roqueplo P. (1992)
3. Global Chance-SOLAGRAL (1998)
4. Commitments which appear very modest in view of the issues of global warming, judging by the views of James Lovelock, creator of the Gaia Hypothesis. 2004.

decision making process for the benefit of managers is still a very real one. Decision-makers need to be enlightened in a more practical way regarding the concrete issues and consequences which may result from the practices and uses associated with natural habitats.

A discrepancy between international debates and local management

How can technological solutions meet the aims of the community? There are two ways of seeing things. The first, which has long been preferred, involves putting the emphasis on the centralisation of knowledge, production systems and management. It would create a macro-photograph of reality – population explosion, increased consumption, demands on resources – in an attempt to come up with solutions to meet the needs identified by the experts. The power to make decisions would remain firmly in the hands of a small number of experts. This form of appropriation of power by a minority not only stands in the way of the sharing of knowledge, but is also detrimental to the protection of the environment. The fact that even knowledge of the environment was seen from a centralizing point of view, in the form of weighty systems of calculations, environmental impact studies, etc., explains why the debate about environment and development has for the most part up to now taken place at the national or international level. This type of worldwide debate, which is necessarily statistical and therefore superficial in comparison with the range of real situations, is in contrast with a different way of thinking. According to the locally-based thinking, it is more effective to find solutions that respect the cultural and ecological uniqueness of each situation. Only shared management that brings together all the users of the land enables the traps to be avoided, whether they take the form of the status quo or of an arbitrary management which is itself the source of conflicts. The philosophy is to bring out the shared aspirations that transcend the sum of individual interests, with a view to the cooperative management of common assets[1].

The lack of any appropriate institutions for sustainable development

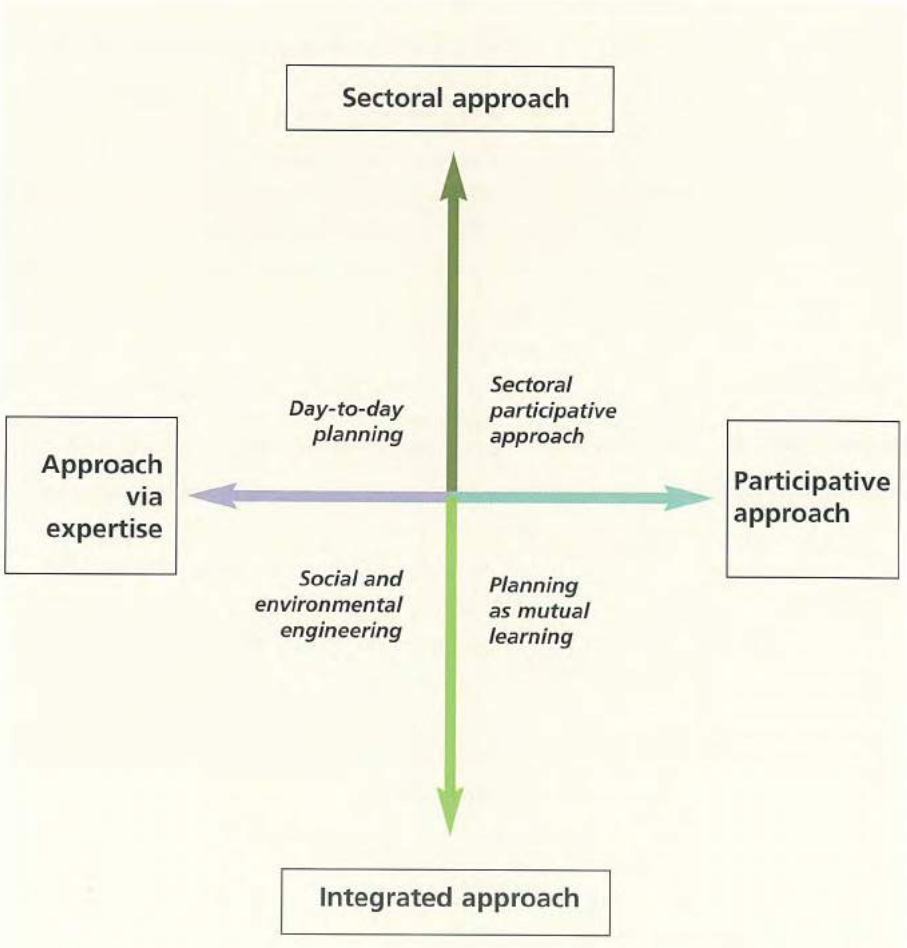
Local debate and activity presupposes decentralisation, with subsidiarity to the lowest level of the decision making process. Once sustainable development has become a priority, the appropriate technological and social response will first depend on the capacity of a people or a country to express this need collectively and to satisfy it. This is neither the case for the countries of the South nor, when all is said and done, for the whole of the planet[2]. The crucial factor is of

1. Mermet L. (1992) *2. Barrère M. (1992)*

course the absence of any appropriate institutions, in the absence of which people cannot express themselves collectively. It is the lack of any recognised political power at the different levels concerned which is the problem: without this it is impossible to establish firm and binding agreements.

The democratic process focuses too much on the short term?

How is democracy to be encouraged to take the long term into account? It offers a suitable framework for the expression of initiatives and the inclusion of the concerns of those involved at the base, but experience shows that the pressures of the present sometimes tend to mean that the long term has to submit to the dictates of the short term and to micro-decisions[1].



Towards an integrated approach to management

Source: Wolf Armin, Post Ruuben (1998).

1. Salles J. M. (1997)

Questioning the role of the State from the point of view of support for initiatives of local governance

"governance is the capacity of human societies to provide themselves with systems for representation, institutions, processes, social bodies, in order to take part in a movement of their own volition"[1] Some analysts, on the basis of this definition, conclude that there is a very profound reversal of the balance of power between simple power, "society" and "nature", calling into question two hundred years of public administration. This disruption implies a change from a society where the role of the state was limited to the establishment of sufficiently equitable and general standards for all citizens to a society where the State has to ensure the functioning, in harmonious interaction, of three types of complex systems: ecological, sociocultural and techno-economic.

Insufficient degree of input from communities in the conservation process

The inadequate participation by local communities in making decisions regarding management and conservation is particularly highlighted in the documents produced in the framework of the Ramsar Convention. Resources cannot be conserved without the participation of the communities which make use of them, and which have often organised themselves in order to manage them. Without the effective involvement of the communities in the management process, the question of the sustainability of conservation activities remains hypothetical. To this end, it is necessary to "make special efforts to encourage the active and informed participation of local and indigenous communities in the management, through appropriate processes, of the sites included on the Ramsar List, other wetlands, and their catchment areas[2]".

As these various constraints and lessons have emerged, the nature of the approaches to the management of natural resources has changed considerably, in particular within the disciplines and choices associated with development and growth. Taking the case of coastal zones as an illustration, in France for example littoralisation was followed by sanctuarisation, before integrated management began to take shape.

1. Calame P., Talmant A. (1997) *2. RAMSAR-COP7 (1999)*

Integrated management: evolution of concepts

Littoralisation, sanctuarisation and integrated management[1]

Littoralisation

During the 1950s to 1970s, the development of large industrial/harbour complexes, combined with the boom in sea fishing which was becoming increasingly industrialised and the growth of mass seaside tourism, meant that developments and programmes in this sector came to the forefront. Studies were centred on the rationalisation of development, the modernisation of fishing techniques and increased fishing effort, the emergence and organisation of new fields in the productive sector (aquaculture) and the service sector (tourism), and the marketing of marine produce with the development of large-scale distribution, which was to form the basis for various restructurings of the productive sectors. In this "productivist" context of the "thirty glorious years", the tendency was for increasing optimisation of the systems of production... The key words were: technological progress, economic growth, social spin-offs...

Sanctuarisation

In the years 1970-1990, studies relating to the impact on and rational management of resources led to a greater consideration for intersectoral relationships and a growing awareness of the effects of human activities and of the degradation of the environment; this influenced the creation of the Conservatoire du Littoral in 1975, of the Loi Littoral (Coastal Law) in 1983, and of the Natural Parks. The key words then were: overexploitation, degradation, imbalance... Attention was therefore turned towards the conservation of specific sites, thereby leading to their sanctuarisation.

Integrated management

In the years 1990-2000, a new approach began to take shape, known as "integrated management of coastal zones", which puts the emphasis on sustainable development and the protection and restoration of ecosystems... Voluntarist public actions increased and at the same time participative approaches, community-based management and co-management began to develop. At present, approaches in terms of the conservation of marine and coastal biodiversity are taking on an increasing importance. Concern about the co-viability of ecological and social systems means that interdisciplinary approaches are essential. The new key words are: safety-first principle, governance, coordination or cooperation among actors and finally patrimonialisation"...

1. Rey-Valette H., Cormier-Salem M. C., Point P., Antona M. (2004-2008)

Integrated management: definitions and principles

A highly appropriate tool for sustainable development

Integrated management is defined as a "dynamic process that brings together governments and societies, sciences and decision makers, public and private interests, for the production and implementation of a programme for the protection and development of coastal systems and resources. It has the aim of maximising choice in the long term, favouring the resources and their careful and rational use."[1].
"The Integrated Management of Coastal Zones therefore emerges as the favoured tool for sustainable development and for this complex «eco-socio-system», through reconciling development with the favourable biological condition of resources, and through linking together environmental, economic and social issues."[2]

Integrated management is all the more appropriate in that it is particularly aimed at public assets as opposed to private property. In Mediterranean wetlands, the exploitation of natural resources takes place mostly on private land, such as farms, private estates or land belonging to Communes. But these areas, as has been stressed in the preceding chapters, also provide public assets in the form of landscapes, the biological heritage in all its diversity, the water that flows between the various plots of land.

The various definitions of integrated management all stress three key points which highlight the principal elements of the definition:

• Cooperation between actors and institutions, co-construction of a system for management. Integrated management is essentially a mechanism that unites users, actors and decision-makers from the various different sectors involved. It aims to guarantee a more effective management of the ecosystem while achieving economic development and intra- and intergenerational fair dealing through the application of the principles of sustainable development. This cooperation needs to lead to a genuine co-construction of management methods and sustainable development for the areas concerned.

• Continuous and dynamic management process. Most definitions, especially those relating to the management of coastal zones, recognise that integrated management depends on a process of natural resource management that is continuous (i.e. extending into

1. Cicin-Sain B., Knecht. R. W. (1998) *2. Denis J., Henocque Y. (2001)*

the future), proactive and adaptive (iterative), for ecologically sustainable development.

• The inclusion of a multiplicity of competing or divergent processes and concerns within a conservation strategy. Integration may involve many facets, as shown in the following table. These different aspects of analysis bring to light three areas of concern for the achievement of this integration:

– Integration of social and economic factors within conservation: people and society are at the centre of the sustainable management process. Actors and users affected by management are to be integrated in such a way as to stimulate the emergence of local demand and to support its integration into conservation. This involves harmonising the uses, ways of life and activities of the social actors with the dynamics of the ecosystem. In this context, it also involves integrating long term aspects into decisions which tend to favour short-term economics.

– Integration of policies, so that there is less of the conflict between environment, development and economic growth which is detrimental to conservation. The aim should be the integration of the different policies affecting the land (biodiversity, planning, management of water resources, land use, agriculture/environment, etc.). Also involved is the integration of long-term issues into development policies and investment decision-making processes, which too frequently focus on the short term.

The many facets of integration[1]

- Vertical: integration of institutions and administrative levels within the same sector.
- Horizontal: Integration of various sectors at the same administrative level.
- Systemic: Necessity of ensuring that all the interactions and important issues are taken into consideration.
- Functional: Actions that must be in harmony with the management objectives and strategies.
- Spatial: Integration of both terrestrial and marine aspects of the coastal zones.
- Political: Policies, strategies and plans for the development of the coastal region must be incorporated into more general policies, strategies and plans (including at the national level).
- Disciplinary: Integration of various scientific disciplines and transfer of scientific knowledge so that it can be used by end users and decision-makers.
- Planning: Planning on different spatial scales should not have conflicting aims, objectives or strategies.
- Temporal: Coordination between plans and programmes in the short, medium and long term.

1. Ramsar Convention (2002)

– Integration of the dynamics and functioning of the ecosystems to be protected. The issue here is to take into consideration the complex elements which come into play in the functioning of Mediterranean wetland ecosystems: scale of the catchment area, interface between terrestrial and marine environments, alternation between periods of flooding and drying.

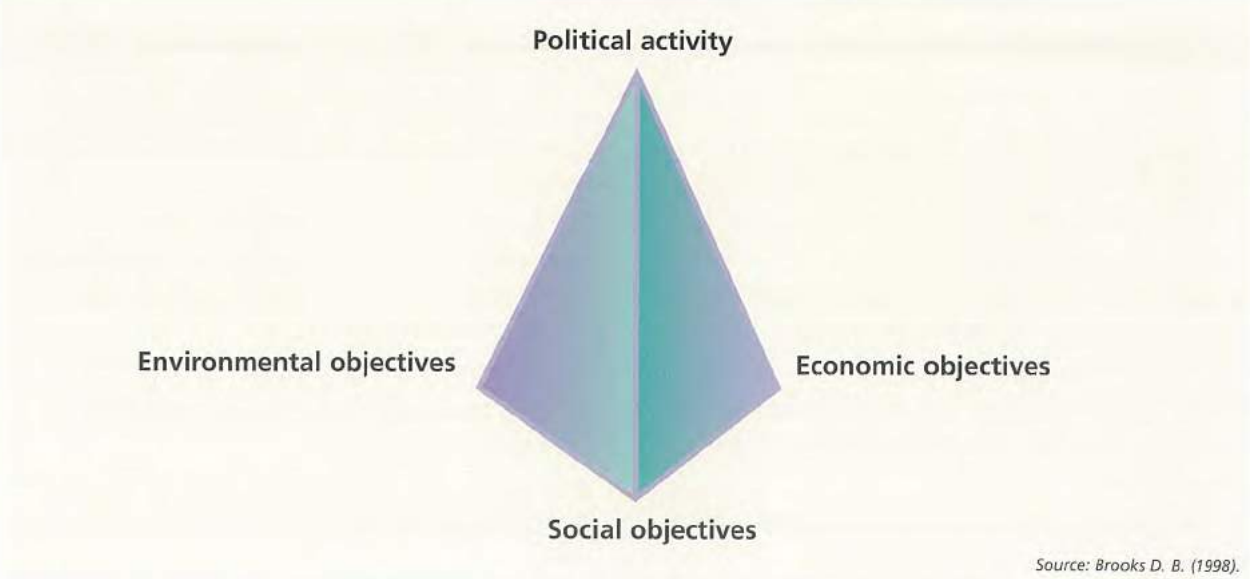
Integrated management: the fundamental principles

Integrated management, through the methods it follows, makes use of a series of general principles and approaches which it is important to recall here before going in more detail into the steps to be taken and the best ways and means to initiate and support the processes involved in the management of Mediterranean wetlands.

The many facets of integration [1]

Models of the integration of policies make use of a triangular figure whose angles represent environmental, social and economic objectives. This approach is useful, but it obscures the political aspect by including it under the "social" heading.

In fact, political action is the principal means, in any society, for progressing towards integration. Another model, in the form of a tetrahedron, can be devised to include not only government authority in the form of elected representatives, but also all the institutions established by the State to carry out its policies.



Source: Brooks D. B. (1998).

1. Brooks D. B. (1998)

The needs of the environment are expressed in a number of fundamental principles which should guide the development of an integrated approach to management; these principles have been very precisely expressed by Kalaora and Charles[1]:

• "The principle of stewardship and responsibility corresponding to the moral obligation of every individual, organisation and institution to act in accordance with the maintenance of the natural heritage and with a view to handing it down to future generations. From being a moral rule this may become a practical principle: control over certain aspects of the environment, regulation of the uses of natural resources on the basis of the law and of contractual obligations.

• The principle of cooperation: integration presupposes acknowledgement of the superiority of cooperation and solidarity over individualism and competition. Cooperation is all the more important when there is a feeling of trust between individuals. This trust itself derives largely from the fact that these societies are not ruled according to a hierarchical principle...

• The principle of instability: integrated management is a continuous, interactive, adaptive and participative process, built up on the basis of a set of interrelated tasks that must all be carried out to achieve the decided aims and objectives, however they have been established and specified. The market cannot by itself fulfil the balancing and adaptive functions, and the same is true of public institutions. All the participants involved must accept the instability of the framework, obliging them not to retreat into their own field or speciality but to be receptive to the multidimensional character of the problem, with no certainty of any indirect or direct return. The fact that the long term cannot be predicted does not obviate the necessity for coming to a precise agreement on the long-term objectives.

• The principle of citizenship consists in the belief that the complex decisions involved in the development of a region or a country, which have consequences for the lives of all, should be subject to forums in which the floor is given to citizens, communities (in this case coastal communities) and to all the parties affected by the issues (in this case coastal issues). Restoring the local populations to a central position presupposes their involvement from the beginning in the formulation of objectives for sustainable development, in the full knowledge of the imprecise and relative nature of these objectives."

To round off these four key principles of integrated management, it is important to emphasise that integrated management naturally accords with more general principles, such as the safety-first principle.

1. Kalaora B., Charles L. (2000)

Towards new modes of governance

In a broad sense, "governance" is understood to mean the exercise of authority and power in the conduct and management of public affairs. It may refer to agreements signed within and between administrative bodies, approaches with a view to decision making, or the encouragements or disincentives by means of which the active agents, governmental or otherwise – including civic society, the general public, local authorities and the private sector – influence social decisions and the allocation of resources. This concept of governance[2] extends beyond the official institutions of a government and recognises the importance of the functions fulfilled by actors outside government circles in the development and application of policies.

The safety-first principle: Owing to present technical and scientific uncertainties, it is prudent to adopt measures that aim to prevent these risks. Since 1987, this principle has appeared in about fifteen international environmental texts[1].

Governance: new modes and relations between power and knowledge

The term governance[3] emerged to designate a new form of decision-making process that is built on an expanded and strengthened interaction between the State and social groups or even individuals. Governance constitutes a complex and variable system of institutional arrangements to include governmental and non-governmental organisations, the legal framework, and the traditions and standards of local communities, to offer new forms of relationship between knowledge and power. While governance provides a very general conceptual framework, it allows the issue of policy to be considered

The safety-first principle and biodiversity[4]

The systematic ecology that developed in the 1970's has shown that everything within an ecosystem is interlinked: the cycling of inorganic elements on the continental scale depends on the favourable functioning of forest and pelagic ecosystems; the phosphorus liberated by soils over the course of millennia is slowly built into living and dead organic material; and the existence of a diversity of food chains (and hence a certain level of biodiversity) confers a certain stability on ecosystems. Consequently, the safety-first principle has become established in relation to human activities affecting the biosphere: it is not known at what threshold of activity the risk of irreversible damage to the great bio-geochemical cycles might arise. From this point of view, the maintenance of a certain level of biodiversity becomes one of the central factors of the safety-first principle which must be applied in any sustainable development strategy; the word "sustainable" in this case being synonymous with "not doomed to failure."

1. Guéneau S., Chetaille A. (1999)
2. Brooks David B. (1998)
3. Kalaora B., Charles L. (2000)
4. Rodary et al. (2003)

from the point of view of complexity and interaction: this highlights its close connection with the concept of integrated management.

Governance is the mode of functioning of a political, administrative, legal, historical and cultural system. It ties in with the mechanisms, procedures and institutions by means of which citizens and groups articulate their interests, exercise their legal rights, fulfil their obligations and settle their differences.

Since the beginning of the 1990's international and European law have been directed towards new ways of defining the norm with a view to supporting the drawing up of environmental public policies. The Aarhus Convention, Article 14 of the European framework directive on water management, and the French law relating to a "democracy of proximity", introduce new principles of public participation in decision-making. It is no longer envisaged that these legislations will provide a uniform solution to a problem, irrespective of places, interests and actors.

This is a concept whose application is proving useful in countries which have implemented a policy of decentralisation as well as in contexts where local government is still little developed. It responds to the concern to create democratic mechanisms based on participation and to coordinate the policies emanating from a range of authorities as a result of decentralisation policies. Even though they stress the high degree of legitimacy acquired by local representatives elected on the basis of universal suffrage, some Natural Parks consider that electoral democracy must be complemented by a participative democracy whose practical details remain to be developed[1].

Community-based governance is an infinitely more complex and demanding activity than traditional management through hierarchies and monopolies[2]. It requires the learning of new functions of which local bodies often know very little.
Whatever the institutional and legal context, "environmental governance" is intended to promote a management system that reconciles the concerns of public environmental policies with users from resident communities within their natural environment. Ecological prudence, economic efficiency and social equality, combined with a transparent decision-making process are the principles of good governance of a territory[3]. In recent years, the term governance has been used to designate the whole of the process of regulation of society, exercised jointly by public and private actors from the moment when these actors of differing status decide together and coordinate their activities. The practice of governance relates to the political, societal, economic and human dimensions of the territory over which it is exercised. It involves all kinds of intermediate stages of

1. Allali-Puz H., Béchaux E., Jenkins C. (2003)

2. Banner G. (2002)

3. Allali-Puz H. et al., op. cit.

discussion and action, training and communication, to provide an improved hearing for local needs, better plans, more initiatives and the creation of a collective consciousness.

Having dealt with the concept of governance, we turn to the evolution of modes of decision-making applicable to environmental management. The change from single-actor decision making to multi-actor systems on which the concept of integrated management is founded is summarised in a typology of modes of decision-making as applied to France.

Typology of modes of decision-making[1]

	1950-70: decision by single individual	1970-80: Decision by an enlightened technocracy	1980-87: Multi-actor decision-making
Decision-maker	"Monsieur" the Engineer for Agriculture, Water and Forestry.	Sudden emergence of new actors alongside the traditional decision-makers: Ministry of the Environment, environmental protection associations, locally elected representatives (strengthening of their influence), etc.	Many decision-makers with more or less equivalent influence.
Type of legislation	Law relating to the supply of electrical power (15 June 1906 – still in force).	Law relating to the protection of nature.	Laws relating to decentralisation.
Basis of legitimacy	Prestige associated with the post. Representing the public interest. Guardian of the public good.	Competence. Representativity. Public interest. State subsidies.	Each person has his or her own legitimacy.
Decision-making tools	Technical and financial studies, to provide the best solution. Regulation.	Studies are primarily more or less sophisticated arguments for convincing others.	Negotiation techniques. Quality management tools.
Values	Authority - Order - Rationality - Law.	Consultation-participation.	Mediation, negotiation, heritage management, quality management, participative.
Mode of decision	Decision by single individual expressed in formalised language describing the best solution.	1. Decision by single individual vindicated through studies intended to provide supporting arguments 2. Decision by one actor-arbiter: modelling enables a choice to be made between two conceptions of public interest.	Multi-actor decision-making – ensuring that actors with differing rationales are involved in a positive way in the resolution of a shared problem.

1. Barouch G. (1987)

Beyond the principles... a hard road

Although general methods do exist, the complexity of the local issues and the wide variety of actors mean that integrated management is still an approach to be applied on a case-by-case basis. While there is increasing experience of integrated management, there are still few examples which can truly be described as integrated. It cannot be denied that the new forms of impetus are often severely constrained by organisational inertia or by various manifestations of political inflexibility.

In spite of all the efforts made and the positive results achieved, there are still a number of areas where major improvements could be

Integration remains poor, in both the North and the South of the Mediterranean

• Assessment of the coastal planning project for Liguria, Italy

During the evaluation of the plan, the work of the various different administrative departments for regional planning was well coordinated. Horizontally, the overall objectives on the regional scale took priority over particular objectives on the local scale. Although a variety of information is available, there is not a great deal relating to the marine environment; the environmental continuity between fresh water and sea is not made obvious. There is also a lack of cohesion at the governmental level: the regional government of Liguria only deals with the terrestrial part of the region, while the maritime part, including beaches, remains the responsibility of central government (Ministry of the Environment). The plan was drawn up by the regional administration (Town Planning Department) but the approach did not pay specific attention to public participation. Consultation took place only between the provincial and municipal authorities, keeping the general public out of the planning.

• Assessment of the National Park plan in the Al-Hoceima region in Morocco

The plan in question reveals a limited understanding of integrated management in that it is based on an ecocentrism that is little concerned with development. As a result, the environmental aspect has been prevalent from the first stages in the production of the plan. Compared with the analytical approach to the natural ecosystem, the treatment of conflicts of interest in the region is limited, as is analysis of the socio-economic costs and benefits associated with the establishment of the Park. The potential roles of the various actors, apart from the Ministry of Agriculture, the Ministry for Fishing and the Merchant Navy, are poorly defined. There is an evident lack of integration to secure the coordination of different sectoral activities and policies within the coastal regions. Public participation is non-existent, and only the various levels of the administration have been involved.

Difficulties and progress in the process of integrated land management

In the framework of a LIFE programme for the Causses in France[1] two major constraints for integrated management should be borne in mind: the wide extent of the land concerned, which forms a distinct unit from an ecological point of view but completely lacks any administrative coherence and the apparently scant degree of interest among local communities regarding environmental issues.

In other words this project has taken a long time to take shape. In fact, it is the fruit of a long period of maturation, of a patient and laborious programme of education aimed at local elected representatives, farmers, the ONF, fishing and shooting representatives and even the naturalists' associations themselves.

Today, even though the programme has not yet effectively begun, the process is under way and appears now to be irreversible. So, despite the differences of opinion regarding the future of the Grands Causses, the various different local actors have agreed that the issues are so important that they should all work together.

However, in order to understand the angry reactions and often very entrenched positions, especially in the Gard and Hérault Departments, it is necessary to realise that the notion of environment is a very controversial one. Because of its generic, multidisciplinary character, it is an ambivalent concept. Because it relates to such burning countryside issues as hunting and control over land, it inevitably engenders acute power struggles between the different participants. Sometimes, on the other hand, it gives people an opportunity to wonder about their living environment and their future. Can farming in the Causses be restricted to a productive role? Is it not managed tourism, based on the abundance of natural resources, that provides a route to new sources of additional revenue? It is from this ambivalence that the LIFE Grands Causses programme draws its infinite richness.

The positions of the actors in the process. In the southern part of the Grands Causses, the project stems from an association-based initiative. This approach has suffered from the outset from a lack of concertation which could have had a very severe negative effect on the future of the programme. This ill-advised initiative by the naturalists' associations is the sure sign of a misunderstanding of the sociological realities of the countryside. In the Causses, as in all French countryside areas, a variety of actors act separately, not to say clash with one another, in what might be called the "local arena".

Each actor, by virtue of his or her position in this arena, defends specific interests, his or her own resources, which reflect varying world views in relation to land use and the environment. In reality, each social group is constantly asserting its own legitimacy.

Faced with urgent ecological threats, the naturalists' associations claim the right to manage the land on the basis of their scientific legitimacy. This scientific aspect confers on them a certain authority, based on knowledge. In addition, the naturalists' associations, organised in networks, are always the first to obtain information about administrative processes originating from Europe, sometimes even ahead of the Regional Environment Directorate.

Locally elected representatives, by virtue of their electoral mandates, invoke democratic legitimacy. This representational legitimacy deriving from universal suffrage gives them important rights in relation to land management, especially since the decentralisation laws recognise the right of the Mayor to establish land use plans. From the ecological point of view, this brings with it certain requirements on the part of the elected representatives: they wish to be informed as a matter of course about any naturalist activities which could affect their Communes. Sometimes, their demands go too far. They wish to participate... in order to take control. There is then a major risk of seeing the local elected representatives, trapped in the thinking of a prominent local citizen, refusing to take part in any external collaboration for fear of seeing their authority called into question. Fortunately, their systematic opposition has slowly given way to an extreme scepticism which is not insurmountable for the future of the LIFE programme.

The farmers lay claim, on their side, to economic legitimacy. Livestock farmers in particular, by virtue of their pastoral activities[2], play a part in habitat management. This socio-economic role with strong ecological implications gives farmers a key position in any process of environmental land management. They are constantly reaffirming this position – even though this strategy has taken a long time to develop – especially since, in the context of the EU Common Agricultural Policy reform, the role of land stewardship is appearing definitively as a source of additional revenue.

And so, by means of some genuinely "collusive transactions", local actors have slowly and constructively been able to reclaim the programme for themselves.

1. Teissier J. (2003)

2. It should be added that their pasturing practices, skills and knowledge confer upon them another type of legitimacy, that of anteriority in comparison with others involved in development working within the sphere of non-profit making organisations.

achieved. An assessment of integrated management initiatives for Mediterranean coastal regions provides an overview of the ground which still has to be covered. It reveals many shortcomings among the thirty or so cases that have been studied[1]: lack of horizontal integration at a high level, lack of vertical integration, lack of effective involvement of the private sector and of public participation in general. There have also been deficiencies in the implementation of integrated management tools for the coastal regions, a lack of replication of successful experiences and a lack of transfer to other sites. The existing pollution-monitoring programmes are not yet being used as management tools. Improvements in water quality and environmental conditions remain difficult to evaluate (quantify); compliance with existing regulations is still not satisfactory. The ultimate beneficiaries of the activities have not been clearly identified and therefore have not been involved in designing the programmes. Coordination between the different elements has not been adequate. The capacity of the administration for planning follow up actions in the form of investment proposals to be submitted for international funding or to other backers has not been satisfactory.

Most routes to local concertation are fraught with difficulties. It is through the capacity of the actors to overcome these difficulties, and thanks to the aquired skills and knowledge of concertation, that these routes can be followed to lead to consensus for long-term management. The box below describes an example of integrated management applied to an area of land located in the uplands of a catchment area on the north side of the Mediterranean. The constraints and digressions in the itinerary that was set up to support this process of integrated management are very clearly revealed.

Integrated management and "patrimonial mediation"...

Faced with such important issues and to complex situations that involve conflicting opinions regarding the uses of and future priorities for the land, it is clear that the scientific disciplines most specifically devoted to the conservation of species and of natural habitats come up against their limits. In this field, the social sciences have a major contribution to make in support of the collective objective that is the desired aim of integrated management.
Only management that brings together all the users of a site can avoid the pitfalls resulting from the status quo or from arbitrary-style management, which may itself be a source of conflict[2]. It is necessary to bring out collective aspirations which are more than just the sum of individual interests, with the aim of a concerted management of common assets, structured around the individual management of private property. At the conjunction of the scientific, economic,

1. METAP-PAM (2000) *2. Mermet L. (1992)*

ecological and cultural spheres, such an approach is fully "within a connection fraught with continuous tension where one is obliged to deal with interdisciplinarity and mediation"[1].

Concertation or negotiation

Integrated management is in general closely associated with concertation initiatives. Concertation often proves to be a working method enabling the various actors to be united and the management strategy to be widely accepted. The establishment of concerted management involves moving from a situation of conflict to creating common ground for negotiations where the actors can co-operate[2]. The term concertation is frequently used in Francophone contexts but even so it is insufficiently precise and is open to criticism, as described in the box below.

Wetlands are no exception to the general rule and are not immune from the risk of the concertation process being perverted[3].

Concertation[4]

"In France, in the field of environment and management, concertation thrives. Neither the word, nor the practice itself, has straightforward equivalents in the foreign literature relating to negotiation. In France itself, the word is ceaselessly employed; the activity itself is often practised, but in the virtual absence of any theory. How can concertation be defined in relation to other, clearer and more familiar concepts?

- Is it negotiation?

Not strictly speaking as it does not necessarily aim to make decisions based on common consent. For example, at the end of a concertation phase, it is the public authorities that will make the decision regarding a development.

- But is it then simply a consultation?

No, in that it is not confined simply to a mutual airing of views. It goes further in seeking, through a series of dialogues, attempts to reconcile positions, proposals and counter-proposals, to tailor planned decisions to the needs of the actors, thereby winning their acceptance.

- Is it a dialogue?

Yes, but in the strongest sense of the word, of "contact and discussion between two parties in search of an agreement, a compromise" *(Petit Robert 1)*, and not in the general sense of verbal exchange.
Concertation is not limited to communication among those involved in making the decision, but includes genuine efforts to reconcile positions.

- Why the success of this concept and this ambiguous practice in the realm of public decision-making in France?

In our view, essentially because it is suited to the drive for acceptability of decisions in the context of a highly asymmetrical power structure...
As practiced in the field of public decision making in France, concertation may be summarised as the partially negotiated preparation for a decision that will be taken by an administrative or political authority."

1. Kalaora B. (1998)
2. Gayte X., Mounet J. P. Perrin C., Rocheblave M. (2003)
3. Navarro C. (2004)
4. Faure G. O., Mermet L., Touzard H., Dupont C. (2000)

Comparison of the theoretical criteria for concertation with their practical implementation in the field shows that these concertation processess are above all procedures for providing information without genuinely guaranteeing the rules of transparency or including the site user as "the central, critical link in the decision-making process".

Territorial mediation and the search for a consensus as a decision-making system

This addresses what Weber[1] describes as patrimonial mediation: "the very long term, collective viewpoint, without which any local action is at the mercy of chance, entails the organisation of negotiation, and so mediation, between various perceptions of the past, the present and the future. There must be a mediator: this mediator will be required to conduct a process of dialogue, of negotiation, the results of which should comprise:

- very long-term objectives (one generation),
- scenarios for management for the medium term that are based on an evaluation of their ecological, economic, social and institutional feasibility,
- the drawing up of a negotiated management structure."

The approaches of negotiated management require certain essential functions without which the process will encounter difficulties in getting under way, and more especially in coming to fruition. To succeed, it needs people who can establish links between the various parties involved and promote a dialogue without, however, dictating its content. Their role is to provide support for negotiation by creating a picture of the local situation, the shared issues, and the various points of view. The point in common among these people is that they promote dialogue, concertation and the search for agreement, without influencing the terms of any such agreement: they therefore have differing standpoints but a shared function. This function[2] is neither to provide a solution, nor to decide between solutions put forward by each, but to support the search for a compromise solution, based on concertation and devised by the local actors, thereby enabling each to feel part of this solution and to accept it. All these factors are integral to this mediation function that is essential for the process of integrated management.

Difficulties associated with unequal distribution of symbolic and cognitive resources[3]

Concertation takes place with a cognitive process of democracy which presupposes the application of new skills and which gives rise to new problems linked with cognitive inequalities. It appears

1. Weber J. (1996)
2. Beuret J. E., Trebet C. (n.d.)
3. Kalaora B. (2003)

generous to provide an opportunity for dialogue, but it would be necessary to ensure that those to whom it is provided can effectively use it.

Integrated Management: participation by communities and associated contradictions

Participation by communities is therefore at the centre of the debate regarding the promotion of sustainable development. This is a recurrent concept which gives rise to many approaches and tools relating to the management of natural resources, and which the theory recognises as an essential condition. Development can only be sustainable if it is effectively taken charge of by the communities that it affects, which presupposes a certain degree of political liberalisation and the effective practising of basic democracy. "There can be no sustainable development if development is carried out to the detriment of our environment; this fact applies to the sound management of natural resources on which the greater part of human activity is based, but also, in a more general way, to the safeguarding of the ecological equilibria that sustain the present living conditions on the ground; it therefore involves the notion of the acquisition of a sense of collective responsibility"[1].

Territorial mediation: between bridge and mirror[2]

Observation of various co-operative management exercises in the countryside reveals two major types of mediation.

- "Bridge-mediation", undertaken by a local actor, who is involved in the concertation but who stands aside from it to provide a link between the parties involved and to facilitate dialogue: his position is that of a "link in the network".
- "Mirror-mediation" on the other hand is achieved through external mediation: the mediator is called upon on a more or less ad hoc basis to present a picture of the situation to the participants that can be used as a support for dialogue. Beuret *et al.* note that many hybrids between these two types are possible, and that in general several mediations, the work of different actors, will coexist in each process. Territorial mediation is not subject to a principle of exteriority and of strict neutrality: the position of the mediator combines a degree of detachment regarding the activity and an undertaking to be neutral, but also an involvement, that enables the mediator to be accepted and legitimised and that appears to be necessary to bring out the views of those who were originally hostile to the process.

1. Lazarev G. (1993)

2. Beuret J.-E. et al., op. cit.

Integrated management: evolution of concepts

The Ramsar Convention takes full account of the importance of participation, elevating it to the rank of an indispensable precondition for the achievement of the sustainable conservation of wetlands. The following excerpt highlights the conditions justifying such concern.

It should be noted that references to participation, undoubtedly much more than to sustainable development and patrimonial mediation, are very noticeable on both the North and South sides of the Mediterranean. In the North, the long-established democracies are increasingly preoccupied with seeking mechanisms for participative democracy. At the same time, they are faced with the increasingly insistent demands of general society, particularly from civil organisations for information, participation and/or consultation, while citizens show an increasingly pronounced disaffection with traditional means of expression via the ballot box. In the South, especially in Tunisia and Morocco, the emerging democracies are also confronted with grass roots organisations demanding new modes of negotiation with administrations that are based on very directive top-down models. In addition, in these countries, under the influence of providers of external financial aid, approaches described as "participative and integrated" have been promoted since the 1990's.

Participation of local communities: a precondition recognised by the Ramsar Convention[1]

"Experience has shown that it is desirable to involve the local and indigenous population as partners in management when:
a. active commitment and sound management of a wetland depend on the collaboration of the parties involved (for example when the wetland is inhabited or is private property);
b. access to the natural resources of the wetland is essential for subsistence, security and cultural heritage at the local level;
c. the local and indigenous populations express a strong interest in participating in the management.

The participation of local and indigenous populations is still more justified when:
a. traditionally, the local parties involved enjoy legal or common rights regarding the wetland;
b. local interests are strongly affected by the management of the wetland;
c. decisions to be taken are complex or controversial (for example when different values need to be reconciled, or when there is disagreement about the system of ownership of the land or the natural resources);
d. the existing management regime does not allow the objectives of rational use to be attained;
e. the parties involved are prepared to collaborate and express a wish to do so;
f. there is sufficient time for negotiation among the parties involved before management decisions are taken."

1. Ramsar (1999)

Tunisia has gone so far as to include the participative approach in its national strategy for the preservation of the environment.

A very large number of initiatives in support of rural growth and development, but also of natural resource management, have been implemented in Tunisia over the course of the last fifteen years[1]. Without exception they have all referred to participative approaches. In documents and speeches, the participation of communities has appeared over this time to be "an alternative to several decades of development based on centralised, bureaucratic planning that ignores the rural communities and the ecological environment within which they exist[2]". In the sphere of Water and Soils Conservation in particular, the initiatives carried out in the past have exposed a relatively low level of exploitation of facilities, and a lack of upkeep and protection of these facilities by the communities involved.

Without embarking on a deeper assessment of these experiences, it should nevertheless be mentioned that the concept of participation creates problems, to the extent that the range of possibilities for its interpretation in the field remains extremely wide. The various interpretations are outlined on opposite page.

Examination of a number of projects demonstrating participative and inclusive approaches, sometimes over more than ten years, shows that in practice, the involvement of communities in development and management of activities remains quite relative. It rarely goes beyond the first three levels on the scale of participation outlined in the box on opposite page. No situation has been encountered where these approaches have genuinely led to the taking of responsibility by local organisations for a process of sustainable management of natural resources[3]. Judging by the writing of Kalaora[4] at the start of the Natura 2000 programme (between 1992 and 1996), the failures of participation have been equally resounding in France:
"Bureaucratic and scientific formalism, subjection of the participative process to a rigid framework, became dominant over any other form of activity. The implementation was structured in such a way as to obviate any objections from the point of view of the actors, any potential for individuals to take on the initiative and to become involved. There has been a reliance on making do with the traditional mechanisms of nature protection policies without taking into account the multiplicity of the actors and the emotional content of the problem, contrary to what was announced beforehand".

1. In July 1995, the CES Law declared the participative approach to be an element of the national strategy.
2. ODESYPANO-GTZ (1996)
3. Bonnet B., Medimegh A. (2003)
4. Kalaora B., op. cit.
5. Charles L., Kalaora B. (2001)

Participation, a wide range of possible interpretations[1]

To participate is to take part, with other actors, in the implementation of an action, in a discussion, in a piece of work, in a decision. But participation may appear in a number of different forms: enforced, encouraged, negotiated or voluntarist. Very clearly, such different motives for the act of participation will result in varying degrees of enthusiasm for assuming responsibility among those who have taken part in the implementation of the proposed action and in the management and its subsequent consequences. This means that assimilation does not occur systematically. In rural development projects or environmental protection programmes, the participation of communities in planned activities may take different forms which result in very variable levels of involvement and responsibility:

- Passive participation, in situations where the community is not opposed to the developments being proposed.

- Participation-work contribution in the form of labour provided by the communities.

- Participation-financial contribution in the form of co-funding organised by the communities.

- Participation-consultation in the case of participative surveys, in which the community is involved. They are consulted by the project and they provide it with information.

- Participation-concertation-negotiation in cases where the community forms an opinion about the project proposals; it is placed in a position where it can ask questions, make enquiries about the project and even negotiate changes in the proposals which are being put to it.

- Participation-co-management: the community has the status of a partner, i.e. it is in a position to take part in decision-making relating to the measures planned on their behalf by the projects.

- Decentralisation autonomy: rural organisations are able to take decisions independently. They direct their technical teams themselves; they have the capacity for managing and seeking their own funding by themselves. In this way the roles are reversed in comparison with the preceding situations. Here, the technicians are approached by the community to take part in designing projects by applying their skills and knowledge...

The full involvement of actors at the last two levels cannot take place without a genuine conviction and commitment on their part to the implementation of actions which they have developed. This commitment by local actors around a shared vision for their land is essential for the initiation of a process of local development.

1. Bonnet B., Medimegh A., op. cit.

Local development and concerted management of local land

Beyond participation... local development and concerted management of local lands

On the ground, a considerable number of individuals in charge of participative projects, who have played a part in implementing the experiences considered within the framework of this review, refer to this concept in order to outline a new horizon enabling the responsibility of communities for the management of their land to be taken further. However, the degree of latitude conferred on them varies. The Office de développement du Nord-Ouest, having been one of the main promoters of the participative approach in Tunisia, is now firmly committed to this perspective, and is establishing the specific elements of a definition of local development:

- Multiplicity of actors (thanks in particular to a widened consultative framework),
- Firm roots in a territory that becomes the subject of a common long-term vision,
- Synergy of implementation giving coherence to the various activities,
- Decision-making powers recognised by the community,
- Decentralisation of funding methods.

These terms express an ambition for local development initiated and controlled by the community, which is responsible for the complete overseeing of all the work required for the activities that it has itself defined in detail and in relation to the medium term timescale that it has defined for its land. There is also a close relationship with the concerns expressed above regarding sustainable development.

It is useful to compare this emerging vision of the actors in Tunisian rural development with an earlier definition. This describes local development not on the basis of project initiatives but completely from the point of view of the socio-economics of the various rural contexts subjected to severe economic constraints. Houée[1], one of the actors and organisers in an example of a project in France, defines local development as a "global initiative for mobilising and uniting local actors for the development of the human and material resources of a given territory, in negotiated relationship with the decision making centres of the economic, social and political contexts in which they operate". This definition clearly highlights the social content of the concept and stresses the endogenous character of the processes.

The box on opposite page presents six key factors which constitute the general framework of the local development process. One would

1. Houée P. (1987)

Six factors characterising local land use planning[1]

Local development is a process before it becomes a programme

Awareness by the community of the situation in its different aspects, and the display of the problems that it is experiencing, form the basis of this process and enable appropriate solutions to be devised. It is only then that the programme (exterior support) enables the solutions to be implemented.

The development depends on endogenous forces, on local networks

Socio-economic groups (farmers, artisans), middle management, networks of neighbours, of kith and kin. These forces assess themselves in terms not of representativity but of involvement in the process. What is important is the ability of these actors to carry out activities which will in fact be those of the network or of the multiple networks to which they belong...

Local or social development is territorial, not sectoral

The basic premise is that in any physical place, everything is linked. The creation of a context that is favourable for the creation of economic activities presupposes the availability of suitable equipment, a trained population, an active social and cultural scene...

Local development seeks opening-up

Rural societies far from the major transport links or from industrial and urban centres, remote districts isolated from the centre of town, trapped communities, need to progress towards the building up of the district or the locality, and not its destruction and reference as a problem area.. It is therefore necessary to assert a specific identity in mobilising local resources and forces, whose objective is to breathe life and dynamism back into an area, as it is only from this position that it will be possible to be part of the global society, of the town, and to become a partner in real negotiations with the outside world.

A process of local or social development presupposes that the various economic, social and cultural actors identify the activities

There are places, within a local area, where these proposed activities are discussed and initiated. However if the development process is not to remain as just a series of unconnected actions or a mere catalogue, a place for dialogue is required where links and alliances can be established between activities and between actors. It is necessary to aim for concrete planning over a certain time, with defined objectives and anticipated results. The procedures (methods introduced by support projects or organisations) are very helpful in establishing such a programme that is in full view of everyone and is negotiated between the actors and the funding providers: short-term activities but with a medium or long-term objective, such as reduction of unemployment through job creation, improvement of qualifications and equipment, habitat improvements, cultural creativity.

The establishment of a medium for negotiation is one of the criteria for advancing the process of development

Any area, any community subjected to a traditional, institutional type of management in which no discussion is really possible, especially if the area is not organised, cannot appear as a genuine partner. The establishment of an instance of multi-partnership on the local level may enable a local structure to be built up, with the help of discussion and shared efforts, which will also involve many other exterior elements, other networks..."

1. Mengin J. (1989)

stress the striking parallel between this and the Office du Nord-Ouest definition given above, as well as with the social issues raised by patrimonial mediation, as discussed in the preceding chapter.

facilitating the establishment of a broader, tried and tested partnership

The establishment of a worthwhile partnership which has a true sense of aiming to achieve integration and, beyond that, of extending to the wider community, constitutes the most important challenge to be met in embarking on a process of integrated management. A study of successful experiences in the field of integrated management of coastal wetlands reveals nine key principles.

Nine principles of the Coast Link network of European coastal authorities[1]

Experience and continuity
A partnership takes time. There are no miracle solutions, nor is there any alternative to understanding and knowing the local situation.

Resources
Participation requires money and people – planning is necessary.

Neutrality
The project leader must have the confidence of all the parties involved, or of a high proportion of them.

Mutual respect
A coastal community is a community of specialists – fishermen, port operators, sailors, who have different points of view regarding the environment but are just as knowledgeable as scientists and planners – the management of coastal zones must be a partnership among equals.

"Project champion"
Is there a local "project champion"? A personality respected within the community who can lead the project.

Communication, openness and simplicity
The process of integrated management of coastal zones is based on consent and so must be transparent. No jargon, no technical terminology, keep it simple. Make use of your technical staff and train them to collaborate with the local participants.

Demonstration projects
small-scale, practical projects – rapid success – to bring together the parties involved and to demonstrate the value of collaboration.

Control
Paying particular attention to the value of working together on the local scale to counter centralised power. "Why sit at the back of the bus when you could be driving it?" If you do not ensure that there is local control over the process, someone else will probably take over, someone from outside the project zone.

Place
A shared vision.

1. Shipman B. (2002)

Role of the State, regulatory safeguards and support for contractual agreements

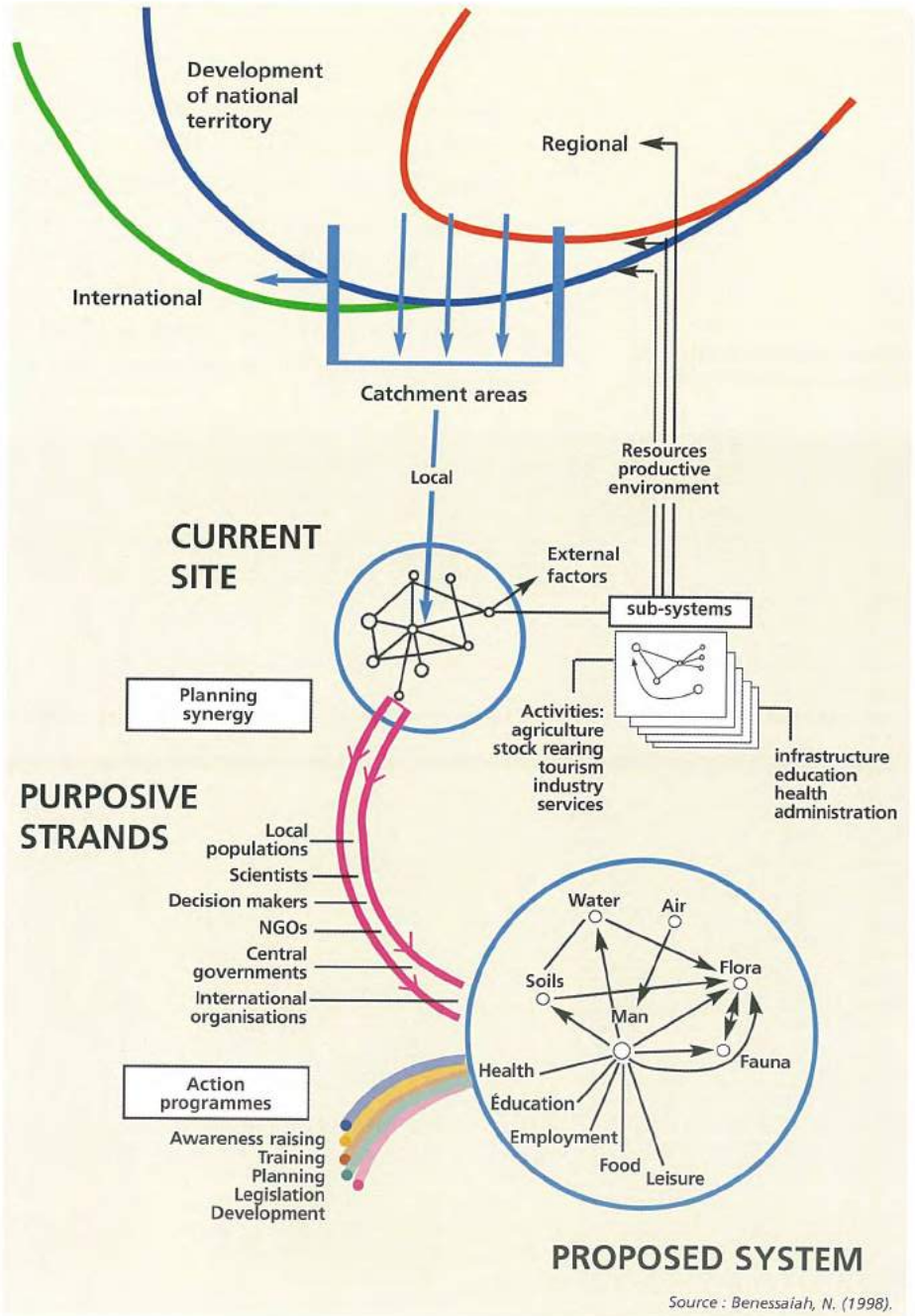
The implementation of integrated management initiatives, testing out the process of environmental governance, needs strong support in the institutional and legal sphere. Depending on the country and the context, much work still needs to be done in relation to the firm establishment of conservation institutions and services. Thought also needs to be given to the status of local conservation bodies each time local actors wish to become involved in a process of negotiated management that involves a range of participants, from general society (more or less formally organised) to institutions (both national and local).

In this process of integrated management, the State must become involved and accept its responsibilities, more in relation to values and principles than to mechanisms and procedures. From this perspective of negotiated management, rights should not be relinquished or weakened; on the contrary, rights and strengths should be rediscovered, reaffirmed, building on new opportunities for re-establishment and for giving support to the process. The written word as well as support programmes in this field may stifle local initiatives,

Nature protection boards at the Moulouya river mouth (Morocco)

Medwetcoast, Morocco

in terms of both content and form, by channelling them through an excess of formalisation[1]. It is important therefore that the public authorities ensure that procedures and rules are put in place to enable these initiatives to be supported and strengthened without depriving them of their meaning or cutting them off from the local context. It will therefore be necessary to make every effort to ensure that the initiatives that have been developed, established largely on the basis of co-operation and negotiation, can avail themselves of effective "regulatory safeguards" that will strengthen the local agreements[2].



Parameters to be included in the strategy for sustainable management

1. *Beuret J.-E., Trebet C. (2000)*

2. *Salenave M., Roudier C., Gamet R., Laurent A. (1993)*

Integrated management: evolution of concepts

The management of environmental issues is associated with a slight drop in recourse to regulatory constraints and a corresponding increase in contractual negotiation in some countries including France. Whereas resorting to the regulatory method presupposes a uniform application of the rules over the whole of the territory, recourse to contractual agreements presupposes the development and application of standards negotiated between the territorial actors and the interest groups.

The laws produced by States can introduce some room for manoeuvre in the resolving of environmental problems. They must offer possibilities for settlement to the various different actors and should no longer be based on a concept of a uniform procedure independent of the places, interests and actors involved. Contractual agreements are the fruit of interactions between the various co-operating parties. They formalise in one standard-setting act the results of negotiations that have the aim of resolving conflicts over management or uses. Contractual agreements also create the legal framework for evaluating and adapting management activities as they are being carried out. In achieving environmental compromises, Contractual agreements build up networks of actors; this is a new method of carrying out public activities, based on co-regulation[1], which complements the injunction of a unilateral administrative act resulting from regulatory standards.

Warden at Tyre coastal reserve, Lebanon

Medwetcoast, Lebanon

1. Navarro C., op. cit.

C. Perennou / Tour du Valat

Criteria and tools for integrated management

The diversity of situations highlighted in the preceding chapters means that it is impossible to set up a standard approach or model for an integrated management process. We would like to set out a series of questions centred on the practical implementation of integrated management initiatives. It is based on a number of reference publications and experiences useful to the actors who, in their own situations, wish to promote the integrated management of wetlands and are giving thought to the definition of a suitable strategy.

The answers to the questions do not provide universal solutions or models. On the other hand they form an outline for discussion and they are also illustrated by practical experiences in the management

Traditional fishery in Biguglia, Corsica

of Mediterranean wetlands. They are based on contributions and accounts from actors directly or indirectly involved in these processes of management of Mediterranean wetlands. They also include important recent work related to the integrated management of coastal zones. This discussion of methods and tools also makes reference to some experiences, sometimes from an earlier stage, that are more widely related to the sustainable development of rural areas. The initiatives in support of local development provide, from this point of view, fertile and useful food for thought. They give rise to tools that are relevant because they are centred on integrated management of the land. Particularly when an improvement in the expression of social, ecological and economic concerns or the involvement of communities in a project is concerned, there will accordingly be wide recourse to the use of an iterative process that links medium term planning with short term practical activities.
The suggested route to facilitating the elaboration of an integrated approach to the management of Mediterranean wetlands is set out in the following set of questions:

- In what contexts is integrated management to be applied? What favourable context must be supported?

- On what scale should an area be selected for management?

- Which key actors to involve in the process?

- What kind of supportive approach to promote negotiation between interest groups that are ignorant of each other, rivals or sometimes even in conflict?

- What organisations and structures to lead and promote such a process?

- How to identify and strengthen the capacities for mediation among the actors?

- How to strengthen the capacities for governance among those responsible?

- What should be the role of the State in support of integrated management initiatives?

The key principles of an integrated management approach

Before embarking on this process of discussing the operational questions which confront the actors and promoters involved in integrated management, the guiding principles set out for integrated biodiversity management projects will be recalled here. They relate to the biological, social, economic and physical fields.

Regarding the practicalities of the conservation of Mediterranean wetlands, in designing integrated management initiatives attention should be paid more specifically to the following points:

- Initiation and support for management processes that bring together decision makers, users and local associations.

- Promotion of the development of management structures that are legitimate in the eyes of the various users and actors involved and are capable of carrying out the process of integrated management. This involves strengthening the local capacity for organising for conservation, and enabling the State to recognise the role and responsibility of these structures.

- Overcoming the constraints associated with institutional and political divides (especially on the North side of the Mediterranean). This involves in particular the creation of cohesion between local, national and international policies insofar as they relate to wetlands, and striving to ensure that they are recognised and effectively applied.

- Changing the relationship between local communities and the top-down structures of the State, which are resistant to decentralisation (more particularly on the South side).

- Creation of the capacity at State level for intersectoralism and for recognising wetlands as a subject of conservation.

- Creation of conditions for a new mode of sharing knowledge, in view of the current uncertainty surrounding the understanding of the functioning of wetland ecosystems. It is necessary to move towards forms of experimentation, of knowledge sharing between users and scientists, that relate to co-learning. In this context, there is a need for a monitoring and evaluation system that is recognised by and is useful to the users and decision-makers involved in the management of wetlands.

Guiding principles for integrated biodiversity management projects[1]

Biological

- Adoption of an ecosystem approach, taking into account biodiversity and the structure and functioning of habitats.
- Identification of more efficient ways to utilise biodiversity, particularly through new ways of making use of the biological resources, strategies for diversified resource management and the use of appropriate technologies.
- Reduction of negative impacts on biodiversity, in particular the extinction of species, the introduction of species and the loss of locally grown crops.
- Increase of the available natural resources and maintenance of existing biodiversity for future generations.

Social

- Respect for cultural and social contexts, as well as expressed needs, in choosing approaches that are appropriate to the local conditions and taking full account of local knowledge and traditional usages.
- Involvement of poor and/or marginalized groups (in particular women, indigenous populations, youth, etc.) in the development process.
- Encouragement of participation by all actors, particularly through the development of partnerships between society at large, governments and the private sector.

Economic

- Encouraging the introduction of positive incentives and reducing market distortions that have an impact on biodiversity.
- Promoting access to the market for all social groups and fair commercial practices.
- Promoting the fair sharing of revenues and costs (including foregone benefits) resulting from a long term strategy for biodiversity conservation.
- Recognizing that securing adequate funding over the long term is a fundamental requirement for the sustainable management of biodiversity.

Political

- Promotion of cohesion and links between the international, national and local levels, particularly by following through the commitments undertaken in international agreements.
- Consideration of political, legal and institutional reforms (particularly decentralisation) which can favour the sustainable management of biodiversity.
- Respect and promotion of rights, customs and local modes of utilisation of natural resources.
- Inclusion of the biodiversity dimension in all spheres of activity, within the framework of national and regional biodiversity action plans.

1. Davies G. (2003)

In what contexts is integrated management to be promoted? What favourable context to support?

As in the process of local development and physical planning, the basis for identifying an integrated management situation comes from the origins of the initiative.

The most favourable and propitious contexts for an integrated management process are those within which there are elements of a willingness to act or initial actions in the context of the development of the area and the preservation of natural resources. Situations of crisis and conflict may also generate changes. They may oblige the actors to look again at the management of the area and may give rise to favourable disruptions. These conflict situations may therefore be considered to be potentially favourable situations.
Following a detailed analysis of the dynamics of the cooperative management of the rural areas, Beuret[1] sets out a grid showing the dynamics of rural area management which relates to the integrated management of wetlands. He distinguishes two major types of context which may play a key role in the process and in the supportive approach to be applied:

- When the local actors give free rein to their creativity and can apply a bottom-up approach.
- When the initiative comes from elsewhere and seeks a local pitch.

Local dynamics favourable to integrated management

These bottom-up approaches mean that the initiative is taken by the local actors within an area which they perceive as being their "common property". This constitutes a considerable asset that is especially propitious in the process of integrated management. These bottom-up dynamics may have their origins in three types of situation:

- The dominant role in the initiative may originally be taken by either an institution or a leader. Bottom-up approaches may be undertaken by institutions who consider that they can fulfil a function in the management of the natural environment (in particular, local authorities or professional organisations extending their fields of activity). They may also be undertaken by social leaders in defence of

1. Beuret J.-E. et al. (2000)

a cause to which they attach great importance. In this case, the approach remains very informal at first and subsequently becomes gradually more organised. It may then be taken up by an existing institution in its own right, give rise to the creation of an *ad hoc* institution, or remain informal. The fact that the process depends on one or a small number of people confers great flexibility but the structure is also very fragile to the extent that it does not receive institutional support (from an association, a consultative organisation, an extra-municipal commission, etc.).

• The initial impetus may also be organised around the resolution of conflict. The initial context plays an important role, especially in institutionally-based approaches. Sometimes the institution wishes to resolve a local conflict and its initiative may go to varying lengths. It may be satisfied with "clearing the air" through mediation or specific arbitration, but it is often the case that it uses the initial impetus, based on a conflict, to develop a local project and thereby to address the problem in a more permanent way. It may then develop its own project or may set up a permanent consultation unit. In this way "environment observatories" may arise, set up by local public bodies, which both provide room for consultation and form the places where projects are developed.

• The initial impetus may thus be organised specifically in project terms. In other cases, the institution acts directly within a project perspective, with varying motives. It may be a question of preventing latent or potential conflicts, or of bringing activities into cohesion during the formulation of an overall development project on the scale of the area concerned. This may provide the opportunity to improve or acquire skills in the field of rural area management for local authorities faced with highly sectorally-based agricultural management.

When there is insufficient local momentum, the initiative must come from outside and establish a local pitch

What are described as "top-down approaches" originate with institutions that are external to the area in question, when there is no explicit social demand in favour of concerted land management. The external actors must then seek to establish a local basis for their activities. There are three types of situation here[1]:

• Institutions outside the territory wish to establish a dialogue with local institutions with a view to putting their policies for development or management into practice. Consultation is then institutionalised within committees, for example environment observatories established at the Department level.

1. Beuret J.-E., op. cit.

Mobilisation of actors and parties involved

The Narta Lagoon in Albania

The Narta Lagoon is located in the Vlora district and is the second most important in Albania in terms of its surface area and its waterbird populations. Part of the lagoon is taken up with salinas, which are among the most important in the Balkans. The remainder consists of a mosaic of fascinating landscapes: islands, forests, sand dunes and beaches, which support bird species of national and international importance and make the site the most important in the country for its bird fauna. The Narta Lagoon meets the criteria for Ramsar sites and, at present, the site is proposed for "protected area" status.

While the lagoon has been included since 1999 on the MedWetCoast project's list of conservation sites, in March 2002 the Albanian government gave authorisation to a private Croatian company for oil extraction and exploitation in a sensitive part of the site. This sparked an immediate reaction on the part of environmentalists and experts in the protection of the lagoon and its resources, followed by a spate of debates, meetings and controversy. The movement was supported by all the country's youth organisations as well as by the associations of professions in the region – fishing, salt works. Demonstrations on an enormous scale were organised at Vlora and Tirana and a petition was signed by 35,000 people in less than a month.

Meanwhile the works had commenced at the lagoon: a road had been opened and the extraction site prepared. The debates continued and involved the media, organisations and experts. In spite of the opposition, the extraction work began.

The company was then subjected to intense scrutiny, under the coordination of the MedWetCoast project team, and was obliged to minimise as far as possible the damage in terms of pollution. In March 2003, the company announced that its tests had not borne fruit and stopped the work.

The company had committed itself to rehabilitating the site after the work. And the next task was to ensure that the site would be returned to its original condition. Today there remain few traces of the oil exploration attempt; in the end it served to mobilise all the environmental actors and the local communities, who up to now remain deeply involved in the management and protection of the site.

Sylvie Goyet
MedwetCoast Project
Station Biologique de la Tour du Valat

• Institutions outside the territory wish to deal with a technical problem with which they are faced, for example a decline in water quality leads an urban authority to take action upstream in a territory which is not its responsibility. It has acquired land within a catchment area and seeks to raise the awareness of the farmers so that they will alter their practices.

• Institutions outside the territory wish to develop co-operation of a voluntary nature within the framework of an activity that they are funding. For example the promoters of the programme wish to convince the farmers to join in and to involve the highest possible number of local actors in the programme.

In the last two cases, co-operation is "trying to happen" and it may be seen that the local actors respond more or less favourably: The issue is to "find a meeting point" between the external impetus and local initiatives which already exist or which still need to be created. This is especially difficult within strictly top-down structures. This poses fewer problems when the external initiator gets to the crux of the already existing local initiatives. In this case, the State is an important driving force but acts within a context in which there are already many local associations wishing to preserve the natural and living environments. From that point onwards, public administration, elected representatives and the associations representing the users participate together in directing the activity within an ad hoc association. This type of approach is described as "top-down-bottom-up".

Exploitation of reedbeds

E. Duboper / Tour du Valat

On what scale should an area be selected for management?

Such a question is essential at the start of the process but, presented in the singular, there is no doubt that it stands little chance of being answered.

The identification of a suitable area for wetland management requires an examination of a range of scales around which to plan. These scales relate very clearly to the range of aspects which it is wished to see included in the management process: ecosystem, economy, local society and politics.

The problem-space, analysis and management on the scale of the catchment area

The wetland catchment area: a spatial scale for integrated management of water resources

A catchment area is an area from which the flows of water converge towards the principal water body[1].

Hydrographical basins constitute a primary unit for the management of water resources; on this scale the various areas which supply Mediterranean wetlands can be included together. The catchment area is considered as a coherent physical unit in which all the processes of the ecosystem (circulation of water, soil regimes, development of vegetation and fauna) are linked. Within this area, the activities of each actor are going to have a direct influence, particularly as regards water utilisation upstream of the wetland and the downstream discharge of waste water. The Ramsar Convention makes reference to this essential spatial scale for managing hydrographical basins in its guidelines for integrating the conservation and rational use of wetlands (Resolution VII.18).
The catchment area therefore constitutes a spatial unit for analysis, strategy and action that must be taken into account from the technical point of view[2], but it rarely constitutes an administrative or socio-historic entity that is coherent enough to be directly amenable to an integrated management approach.

The problem is that the size of the catchment area is sometimes enormous, ruling out the feasibility of a concerted approach. This is the case with most Mediterranean river deltas. An exercise in cooperation on the scale of their catchment areas would entail a long process involving actors whose interests are far too wide-ranging or divergent to enable a consensus to be arrived at. In the case of the Rhone for example, do the inhabitants of the Camargue and of Geneva have anything in common? On a much smaller scale, experiences in managing the Etang de l'Or, in which it was necessary

1. Agences de l'eau (2000)

2. Ornat A. L., Correas E. (2003)

to consider a catchment area of some 400 km², succeeded in involving 13 of the 31 Communes affected. While it is logical to consider the management of resources from the point of view of the catchment area, the involvement of communities which are not situated directly within the wetland and which do not make direct use of it proves to be difficult.
In view of these difficulties, what is required is to develop partnerships and dialogue with the communities whose land is included within the catchment area, even if they are not directly included at the chosen administrative management level (training, information, revitalisation and management activities upstream of the wetland catchment area, etc.).

The social and cultural sphere, the country, the geographical area with which the local community identifies

Determining the social and cultural sphere entails defining the limits of the area of country within which the users can join together around shared historic, heritage and cultural values.

Taking this area into account is essential for the successful mobilisation of local communities in the integrated management process. Its understanding and evaluation should enable the identification of actors who, although they do not live at the heart of the wetland in question or directly surrounded by their resources, will be able to play a key role as providers of information, leaders or mediators in the process of concertation which it is hoped to establish.
The views of the stakeholders regarding the history and practices of management and protection of the wetlands in question constitute a factor in their motivation and interest that should not be ignored in devising an integrated management initiative. Even if this field of study extends into the history of local societies, it is no less useful in assisting interest groups with differing interests to find a number of common values that can bring them together in a process of concertation.
It is at this scale of analysis that it will be possible to detect the practices, skills and knowledge relating to the use and management of the area that can be put to good use in drawing up the management plan that is to be implemented.

The economic sphere: the scale of the strategies for using and developing the wetlands to be protected

Taking into account the economic activity which arises from the exploitation and development of wetlands is also necessary for a proper evaluation of the economic context of the wetland to be protected. Examination of this activity and the economic fields

involved provides an improved basis for assessing the issues and the feasibility of conservation in view of the strong forces of regional, national and international economy.

These economic systems will relate very widely to local production and modes of exploitation of primary resources; but also to economic activity related to tourism, demography, urbanisation, development, etc. It will be important here to identify the factors enabling the trends characterising these different types of activity to be determined and to investigate the factors which may influence, in a positive or negative way, these active trends. This may be, in some cases, a very specific field of activity which will be able to become, through its momentum and the commitment of its leaders, a vehicle for the concerted approach.

The Etang de l'Or: the catchment area and the communities involved in its management

The future of the lagoon is strongly linked with all the Communes within the catchment area. 28 communities are affected in an area of 412 km². The population is 95,000 permanent residents and doubles in summer.
Area of water: 3100 ha. Length: 11 km. Width: 3 km
Area of wetlands associated with the lagoon: 2000 ha.
Boundary of Listed Site* **Communes that are members of the Syndicat Mixte de Gestion de l'Etang d'Or**
All operations with the potential for altering or destroying the condition or appearance of these sites are forbidden without the express authorisation of the appropriate Government Ministry.

Source: Syndicat mixte de gestion de l'Étang de l'Or - Étang de l'Or Infos, février 2001.

The political and administrative sphere: the territory of the communities involved

This aspect is often placed at the forefront during administrative procedures. Its assessment is clearly indispensable in the understanding of the active policies which directly or indirectly affect the conservation of the wetland in question.
It is essential that it is taken into account, so that the local authorities and Government departments can take part in the process being supported. But it should not predetermine the field of activity to be promoted; each of the administrative bodies should from this point of view recognise and support the processes of integrated management without insisting too heavily on a purely administrative division of territory that is defined too strictly on the basis of their respective fields of activity.

Conclusion: for a flexible and inclusive approach to the management of the area

These various interlinked spheres mean that the area to be taken into consideration for integrated management does not correspond to a standard definition. It is not in a fixed state but is undergoing constant change and is affected by a variety of different factors whose heterogeneity is a sign of its richness. The area is in an incessant state of development even though its relationship with the geography, history and cultural aspects remains omnipresent[1]. The development of the area on a local scale presupposes a detailed understanding which enables a more harmonious form of development to be designed which strives to correct economic, social and demographic imbalances. Establishing a project on the basis of a spatial approach and recognizing the differences in the views and perceptions enables to identify problems and issues that are common to the whole of the territory, but also those that are specific to some of its constituent parts (sub-areas, particular interest groups). The objectives for action that arise may then be adapted for different sub-areas, to correct imbalances or to focus on particular purposes.

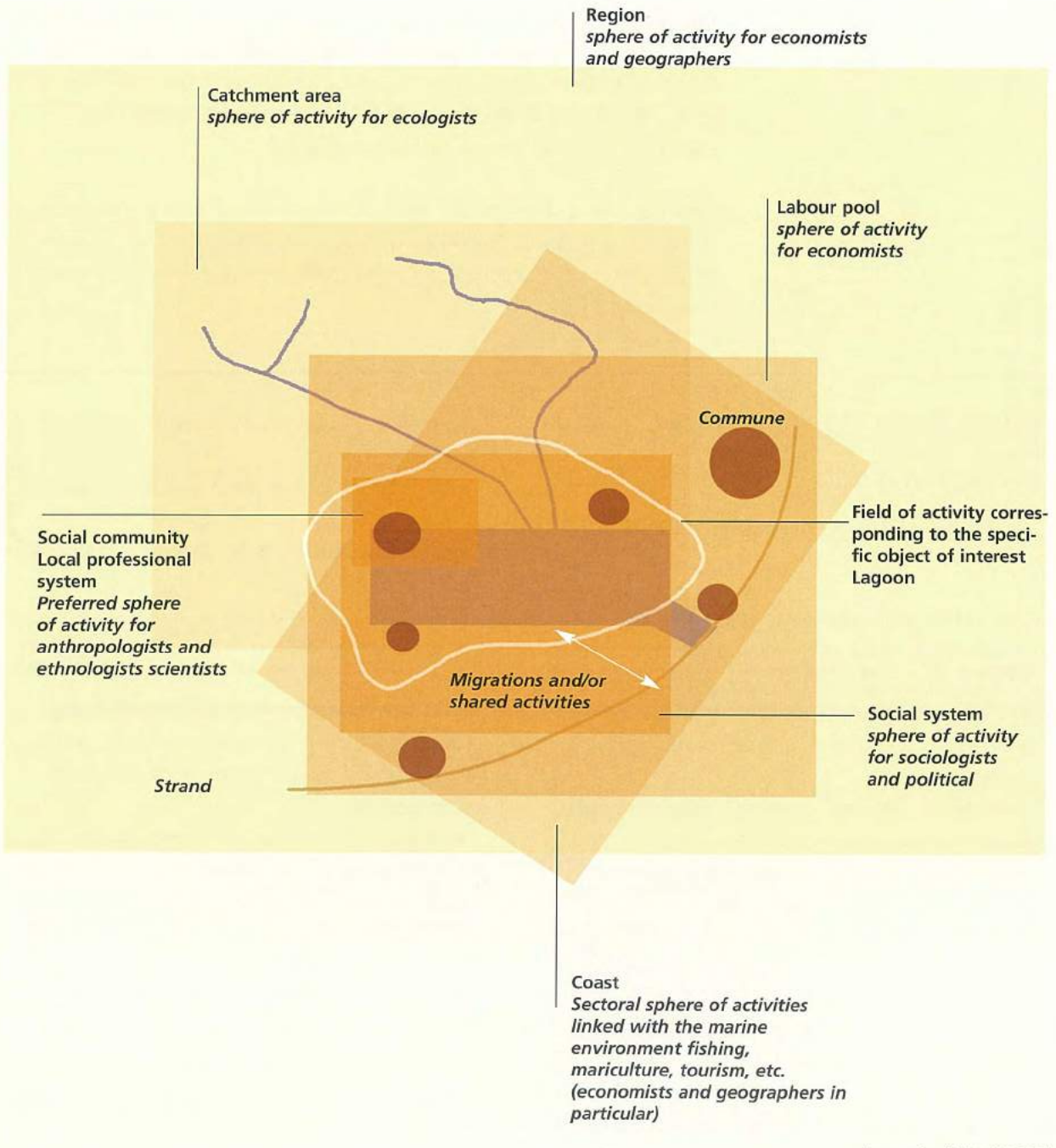
It is therefore only after having identified the different socio-cultural, economic and administrative contexts affecting the catchment area of the wetland in question that an arena for activity and management can gradually emerge which integrates the natural resources aspect into the social and institutional spheres.

As in the case of coastal zones, it should be noted that the geographical demarcation of the area, the territory for integrated management, depends on three main types of considerations[2]: administrative

1. Gorgeu Y., Jenkins C., Gentil A. (1997) 2. Denis J., Henocque Y. (2002)

boundaries, the boundaries of the ecosystem, and the area within which the problem or problems occur. The boundaries of the area to be considered will result above all from a compromise between these aspects, and it will be necessary to remain flexible as the process unfolds so as to include external influences and the actors who will prove to play a key role in the management.

Integrating the catchment area into the socio-cultural, economic and institutional contexts



Source : Rey-Valette H. (2001).

Which key actors to involve in the process?

This question arises repeatedly during the promotion and monitoring of the process of integrated management.

The response varies widely, depending on the context and the stage reached in the process. It arises in a fairly systematic way from the initiation of a process of integrated management. Who can be relied on to provide a better understanding of the issues? How to ensure that this or that category of users or decision makers is fully included in the initial conception of the measures for protection and management that are to be implemented?

Approaches to the production of management plans for protected areas are especially open to question in this sense. We feel that it is of interest in this context to reproduce a grid devised by the IUCN (see box below).

Identifying the key actors to be involved in the management process[1]

The prime individuals having a key influence on the protected area should include:

- Ministers and directors of the authorities in charge of the management of the area in which the wetland is situated and of its resources,
- Local community leaders, activity groups and local advocacy groups,
- Landowners and owners of properties bordering the protected area,
- Users who are exploiting the areas adjacent to the protected area, as tenants or otherwise,
- Company heads, employees and their representatives, particularly when these companies are carrying out economic activities such as supplying water, forestry operations, mineral extraction, fishing and tourism,
- Managers and employees in the protected areas,
- Representatives who organise tourism and leisure in the region,
- Researchers who are involved with sites or projects in the area or its surroundings.

Four key questions should assist in the identification of these various key actors to be involved in the process of integrated management:

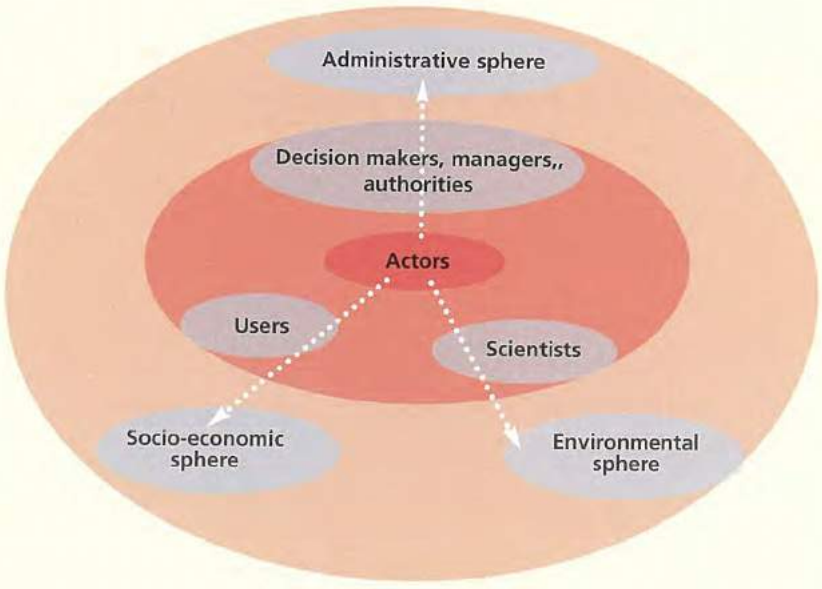
- What relationship do these actors maintain with the region in question, how do they make use of it and develop it?
- What are their various roles and responsibilities? Who makes decisions about what?
- In what way may they be affected, how could they react to a management initiative?
- What is the predominant impact of their activity on the values of the protected area?

1. Lee T., Middleton J., Phillips A. (2003)

Different types of actors become involved depending on the situation and the nature of the problems. An assessment of the potential for their involvement in the various spheres, which is essential if sustainable management is to be introduced, is of course vital at the outset. But it must remain a central concern throughout the initiative as the issues may change during the course of the process. It will then be necessary to be able to allow some actors, who might not have felt involved at first, to gradually find a place for themselves in the initiative that is under way.

The image presented by the traditional conservation organisations (National Parks, Reserves) may handicap them in their attempts to launch a process of open, inclusive concertation. It is important to identify the interlocutors with whom to establish the basis for dialogue, which may often be of an informal nature and which may act as a bridge towards the first stage of concertation.
Study of some concerted area management initiatives in France reveals two main types of factors that motivate leaders to take the initiative in managing the area and protecting natural resources[1]:

• response to a conflict or to what is considered to be a social force (reactive approach),



The range of actors who may become involved

Source : Unesco (1997).

1. Beuret J.-E. (1999)

• the fact of being involved in a management project that has the potential for uniting the actors, and that sometimes forms part of an actual area development strategy (project approach).

A typology of actors can be derived from this same framework of analysis which concentrates on local land development initiatives developed independently of the normal procedures, the actors being free to devise their own forms of co-ordination. Four types of actors appear to be important in giving impetus to the process of concertation:

a. Farmers who take the initiative in the networks, associations or local authorities where they have responsibilities. Their objective is to preserve the environment. A concern to harmonise their beliefs with their activities leads some of them to form relationships with ecology associations in order to improve their management of the fragile natural habitats that are present on every farm. For others, involvement may come in response to a local proposal or a social pressure that is perceived as a threat or as a source of discredit.

b. Local government bodies sometimes approach the farmers. This type of situation arises in response to a deteriorating situation, particularly in areas that have been abandoned by agriculture or for the management of a resource. In other cases the authorities have a collective proposal to develop an area that will cater for residents as well as visitors, which presupposes that the activities on the land will be harmonised.

c. Associations wish for example to preserve and manage an area considered to be noteworthy and of shared interest. In the framework of the investigation in question, associations appear to be uncommon in a sphere where they seem to lack the legitimacy for carrying through initiatives of land development and public participation.

d. Local leaders always play a major role. Such a leader is nearly always a "dual actor", i.e. both a farmer and a town councillor, an elected intercommunal representative and an agricultural advisor or a professional agricultural official. These leaders appear to be associated with the land without being confined to any one sector, enabling them to establish "bridges" between users, with a position as a "node in the network".

This typology clearly illustrates the range of actors and their origins within the local socio-political arena. In other contexts of course other types of actors will be seen to emerge, but this example provides a good demonstration of the necessity for the good positioning of local leaders, enabling bridges to be built between the user groups. It also

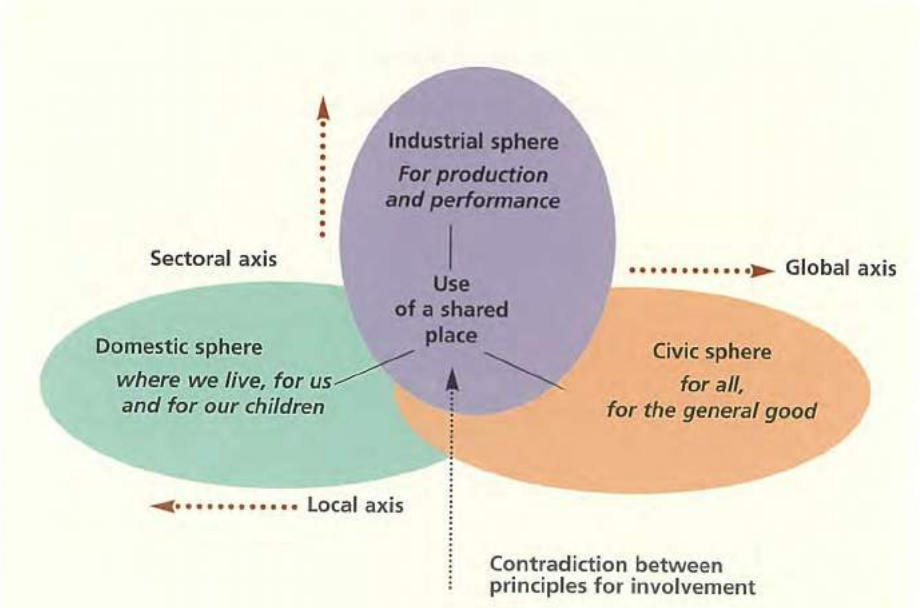
stresses the importance of the role to be played by local governments in the coordination of the actors and in the integration of policies for the management of wetlands within a territory.
The motives of the participants in the negotiations arising from integrated management may differ considerably. They may be classified with reference to three aspects: "the community aspect", "the production and results aspect" and that of the "domestic heritage of the community".

- Some actors put heavy stress on the "community aspect" that prevails in the civic world. The important thing in their eyes is unity in a shared general interest and opposition to individual interests connected with private concerns.

- On the other hand, other actors value first and foremost enterprise and production in an industrial sphere where everything depends on efficiency and technical achievement. The territory is approached by these actors in terms of its productive potential.

- Lastly, other actors consider only the family or the local community, in an approach based on the preservation of a common local asset. Here a domestic sphere can be recognised that is based especially on a temporal order (through respect for custom) and a spatial scale of familiarity (from the local to the foreign)

These three principles are interconnected according to the outline below.



Source: Beuret, J.E. (1999).

The contrast between the principles on the basis of which actors justify their commitment

What approach to adopt to promote negotiation between interest groups that are ignorant of each other, are rivals or are in conflict?

Key principles for an approach which mobilises those involved in integrated management

There is clearly a need for a combination of several principles that favour the emergence and then the strengthening of the process of concerted management as it is carried out. They should lead to the creation or re-creation of social links among the different categories of local users and actors. They should allow divisions between the groups to be overcome, in order to bring them together to design a shared project and to establish mutual commitments for the implementation of this sustainable management project.
From this point of view, integrated approaches to the management of wetlands form no exception to other approaches that aim to involve actors in the elaboration of a sustainable development project that is based on a shared appraisal and the identification of medium-term priorities. The key principles for the promotion of concerted approaches over an area would appear to be widely applicable to the case of Mediterranean wetlands.

Five principles for a concerted approach[1]

- Identify the territory in all its diversity,
- Build the project on a long-term basis,
- Accord a major role to participation,
- Organise alliances with the outside world,
- Tailor the organisation to the territory

These five key principles are highlighted in the framework of approaches that have the aim of drawing up a "territorial charter". They are useful first steps for those who wish to practically initiate an integrated management approach within more restricted areas through focusing more specifically on the management of the natural resources of wetlands. We reproduce here the basis for each of these principles as defined by Gorgeu *et al.*[1]:

Approach the project within its spatial context

- By taking into account the variations and diversity within the territory;

1. Gorgeu Y. et al. (1997)

- By paying particular attention to the land and its heritage;
- By taking care to correct imbalances, but also to draw on unique local characteristics;
- By choosing vocations in respect of the land and making use of their complementarity;
- By working together with the help of visual aids.

Allow ten years for the project

- By identifying the major problems associated with the territory and the issues that come with them;
- By establishing the major axes for the development of the territory;
- By distinguishing, for each of these key factors, those that relate to the whole of the territory and those that relate to different geographical areas;
- By working through sets of objectives to define the type of actions to be carried out and the aims of development.

Establish an intercommunal democracy

- By mobilising the active forces in the territory: elected representatives, economic actors, users;
- By ensuring that their knowledge of the territory is shared between individuals to facilitate the development of a collective process;
- By setting up a territorial authority, based on motivated individuals, that can carry through the project;
- By making sure the partners and the community join in with the project and its implementation;

N. Beck / Tour du Valat

Participatory process with local communities

• By setting up a mode of local government that ensures that the various actors have a part in discussions, proposals, decision-making and the carrying out of actions;
• By involving the communities on a regular and multiform basis in the development of the project.

Devise a project that is open-ended

• Recognise the multi-territoriality of modern ways of life so as to:
• Bring the territories into mutual relationship;
• Integrate into the surrounding urban network;
• Link up the local human, educational and socio-economic networks;
• Take account of the uses and views of other people;
• Put the modes and networks of communication to use for the territory;
• Establish contractual relationships with the external partners who have an impact on the territory;
• Use cooperation and international exchange.

Devise a suitable mode of local "government"[1]

• Create a decision-making assembly that represents all those involved with the territory;
• Make provision for structures for arbitration, proposals and if need be, management;
• Formalise functional intercommunity relationships within the territory and partnerships with other territories;
• Ensure that there is a technical team that is adequate and of a high standard;
• Involve universities and research centres;
• Communicate with and involve the community;
• Organise celebratory and symbolic events.

The box on opposite page describes an attempt to apply these main principles to drawing up a charter for the integrated management of Mediterranean wetlands.

Integrated management is based on a progressive, iterative process

The general pattern of a process of concertation for the establishment of an agreement is difficult to specify in detail. The range of contexts and experiences is so wide that any simplification may appear too theoretical and general. On the other hand any example of practical experience may be seen as being too specific in view of the wide range of Mediterranean contexts presented at the beginning of this work.

1. Gorgeu Y., Jenkins C. (1997)

Drawing up an environmental charter and integrating conservation into public policies in France

The Petite Camargue Gardoise forms the western part of the geological delta of the Rhone in the south of France. While the Grande Camargue, located between the two branches of the river, has had a famous nature reserve since 1927 and a Regional Natural Park since 1970, the Petite Camargue has been the subject of major development for agriculture and its coastline has undergone a process of urbanisation associated with the development of seaside tourism.
In order to rationalise the development of this territory of nearly 35,000 ha consisting of lagoons, salinas, ponds and marshes, the Conseil général du Gard joined together with the eight Communes involved to create, in 1993, an environmental management structure called the Syndicat Mixte pour la Protection et la Gestion de la Camargue Gardoise. This organisation for concertation and cooperation strives to create the momentum behind a project that genuinely reconciles the preservation of natural areas with local development. In 1995, an Environment Charter, an initiative originating with the Ministry of the Environment, was established following consultation. This constitutes a commitment, on the part of the local organisations, to a programme of activities over several years. The main objectives are (1) to encourage applied research at the wetlands in order to gain improved control over changes taking place there, through the establishment of the Scamandre Discovery Centre; (2) To improve the ways in which water and waste are managed; (3) to promote economic activities which favour sustainable development; (4) to develop environmental education and to inform the local communities about the activities taking place. Within the framework of this charter, further actions connected with sectoral, central and local public policies have been harmonised in the form of a pre-emptive policy in respect of sensitive natural areas, enabling the Conseil Général du Gard – by means of a tax – to keep a check on land transactions and to acquire outstanding areas of land, in coordination with the Conservatoire du Littoral et des Rivages Lacustres which also benefits from a pre-emptive aquisition in this part of the coast. Almost 500 ha of marshland have been acquired in this way by the Conseil Général in the Petite Camargue Gardoise and 25% has been classified as Voluntary Nature Reserve. Within the framework of the implementation of the water law of 1992, a programme for development and water management (SAGE) was established in 2000 after five years of consultation and discussion. This affects 372 km_ and a Local Water Commission (CLE), formed from representatives from local user groups and government bodies, seeks to address the issues of protecting outstanding aquatic habitats, controlling the hydraulic regime, and restoring the quality of water, both above and below ground. Within the framework of the Agro-Environmental Policies of the European Union and of France, measures were made available to farmers over the period 1995-2000. In return for compensation, the farmers undertook to accord with a code of practice for management and development as defined by an ad hoc committee. This had the aim of encouraging environmentally friendly grazing and reed harvesting practices. In 2004, they were to be succeeded by sustainable agriculture contracts resulting from the latest agricultural framework law. Finally, within the framework of the implementation of the Natura 2000 network, whose objective is to assist in the protection of biological diversity throughout the European Union, a Special Protection Area of almost 6000 ha has been established. A further 24,000 ha has been included within a Site of EU Importance in order to include together all the issues of conservation of the flora and fauna of the wetlands in this area.
It should be recognised that the plethora of different protective designations and labels has not always simplified the task of the organisers over the past ten years. Similarly the various projects have met with many pitfalls during their conception and implementation. It is no less true that the contractual approach combined with regular consultation appears to be a favourable way to combine the aspects of development and conservation of the environment. Shortly, new contracts are to be set up with the land users for a concerted development of this unique area which, since 1996, has been the 17th French Ramsar site.

Cécile Mundler,
Syndicat Mixte Camargue Gardoise
Raphaël Mathevet,
Station Biologique de la Tour du Valat

Rather than setting out a model approach, here only the general factors involved in a high proportion of territory-based initiatives will be described. Integrated wetland management initiatives and sustainable development initiatives are based on a series of major key stages. Gorgeu and Clément[1] define four strategic stages below.

The territory-based project approache[1]

- The observation:
  - Location,
  - Common characteristics,
- The perspective:
  - Defining the issues
  - Expression of intentions
  - Strategic choices
- The charter:
  - Founding text
- The way and means:
  - Action programme
  - Specific agreements
  - Territorial organisation
  - Links between intercommunal levels
  - Analytical financial monitoring
  - Monitoring for quality assessment

The example on opposite page describes the route taken by one initiative of this type in an area containing a Mediterranean wetland. The stages in an iterative process of integrated management have been laid out by a working group that has referred to around twenty

Medwetcoast Morocco

1. *Gorgeu Y., Clément F. (1999)*

Designing a project for sustainable development of the area

The Narbonnaise Mediterranean Regional Natural Park (France)

A high-quality, natural, landscape and cultural heritage

The Narbonnaise Mediterranean Regional Natural Park (PNR) is located in the Aude Department, in the Languedoc-Rousillon Region. With its 80,000 ha, it represents one of the last remaining major French natural sites of this size and with this degree of diversity on the Mediterranean coast. A varied and extraordinary area, where limestone cliffs arise next to Mediterranean lagoons, the Park, richly endowed with over 8,000 wetlands, is recognised for the quality of its natural and landscape heritage. Playing an integral part in this heritage, its social and cultural activities, both traditional and more recent, give the area a distinctive character:: traditional small-scale fishing, salt extraction, viticulture, recreational activities (hunting, nature study, water sports, etc).

"PNR": a label welcomed by the population and recognised by all

The long quest for the "Regional Natural Park" label (nearly 10 years) has enabled a high proportion of the Narbonnaise Communes to join together in a spirit of genuine enthusiasm among the communities. Designated on 17th December 2003, the territory's Regional National Park status marked the culmination of a project that was long in maturing, supported by many partners: communities, local governments, farmers, artisans, tourism professionals, associations and ordinary citizens. All became involved in this project for the sustainable development of the area.
Since 13th January 2004 the park has been managed by a Syndicat mixte formed from 27 Communes, the Communauté d'Agglomération de la Narbonnaise, the Communauté de Communes Corbières Méditerranée, the Syndicat mixte de cohérence territoriale of the Narbonnaise, the three Consular Chambers (Chamber of Commerce, Chamber of Agriculture and Chamber of Guilds), the Aude Department and the Languedoc-Roussillon Region.
The Syndicat is now in charge of implementing over five years the directives of the Charter of the Narbonnais Mediterranean Regional Natural Park.

The Mediterranean Narbonnais PNR: site of concerted activities

Already provided with a Consultative Council (organisation of local associations and social and occupational groups), Subject-specific Commissions (e.g. "Water and lagoon environments") and technical working groups for monitoring the activities of the Syndicat, over these long years of developing the Park project, the PNR has acquired recognised and tested skills and knowledge in the field of concertation and participative democracy. These skills mean that today it is responsible for many contractual agreements and/or planning initiatives such as Life EDEN, the production of the Natura 2000 DOCOB for the Plateau de Leucate, the Etang de Bages-Sigean and the Etang de Lapalme, and the 'Etangs' Contract for the Etangs du Narbonnais. Begun in May 2000 at the request of local actors, the contractual tool represented by the Etangs Contract has already been the subject of a widespread concertation via the Park's "Water and Lagoon Environments" Commission (elected representatives, members of associations, professionals and site users) and of a Technical Working Group (State departments, local government, public corporations). This Five-year Technical and Financial Action Plan, which is in the process of being approved, will enable the Syndicat to meet the unanimously expressed needs to preserve the lagoons and their associated activities:
– Programme to monitor the levels of pollution and trophic quality,
– Technical and financial aid for carrying out works to improve and restore the wetlands,
– Assistance with the maintenance and development of the activities traditionally associated with the 'étangs', etc.

Eric Voque et Marc Barral
Parc Naturel Régional de la Narbonnaise

integrated management initiatives relating to coastal zones[1]. The methodological guide resulting from this exercise enables a fairly precise framework to be drawn up for the preferred route for the development of a process of integrated management. It specifies a process to take place in three successive stages:

The key stages in the progress of an integrated management process

- Phase I: Preliminary identification
  - Step 0: initial conditions for the integrated management
  - Step 1: feasibility of implementing the integrated management

- Phase II: Preparation
  - Step 2: socio-environnemental assessment
  - Step 3: desirable and possible outcomes
  - Step 4: drafting of the management programme

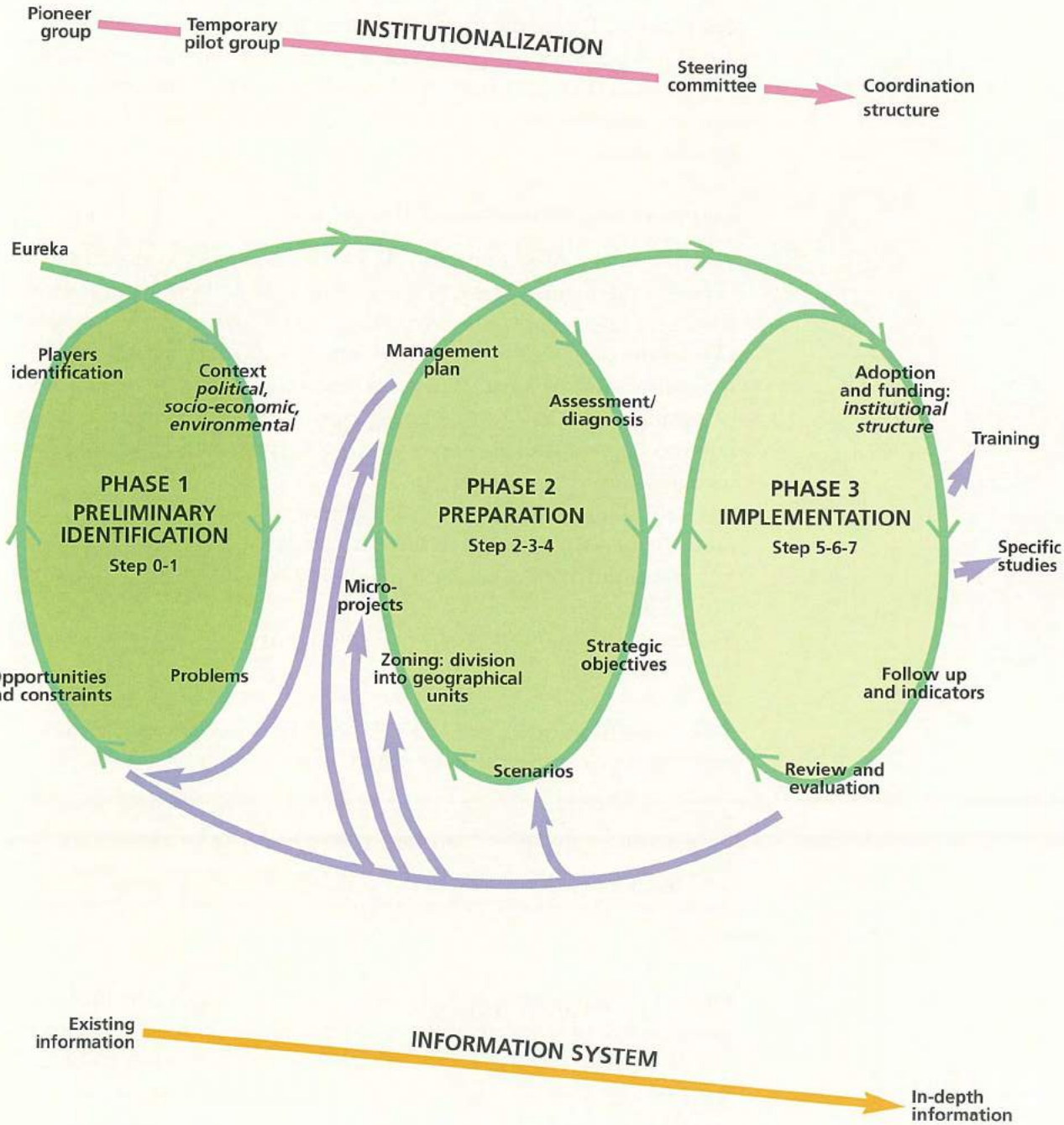
- Phase III: Implementation
  - Step 5: creation of an institutional structure
  - Step 6: implementation of the management programme
  - Step 7: evaluation and adaptation

The evaluation in question stresses the fact that the processes undertaken in an integrated management initiative are equally as important as the results of the programme. These processes converge towards a new social structure by involving the actors, developing operators' expertise, discussing with elected representatives and private individuals, fostering awareness among those who are involved, communicating with the public, etc.

The following outline sets out a cyclical representation of the sequence of and interconnections between the stages of planning an integrated management initiative. The scheme is allied to a planning framework which, in an iterative fashion, brings together the actors around the key stages of analysis, planning, action and evaluation. The evaluation then provides the basis for adaptation of the planning which gives rise in its turn to a new phase of implementation.
It is interesting to note that this representation has strong similarities with the "development project cycle" framework, as defined by the European Union. The value of this outline is that it clarifies the route taken in the process of formalising and institutionalising the organisation, which forms the basis for the process of integrated management and then carries it forward.
We will discuss the main phases of this process in the following section, with the emphasis on those points that are specific to integrated management.

1. Denis J., Henocque Y. (2001)

Outline of the process:
sequence and interrelations of the planning stages



Source: Denis J., Henocque Y. (2001), adapted from Salm & Clark (2000).

Initiation, direction and feasibility of an integrated management initiative

This preparatory phase is essential for establishing an integrated management approach and in particular for assessing its feasibility. Two factors appear to be crucial for the empowering and success of this process. Firstly the legitimisation of the participants who lay down the basis for dialogue. The issue is then the assessment of the connections that exist between local developments and the systems that are implemented by the public authorities to encourage and/or support them.

Initiation – legitimisation of the process

The first stages play a crucial role in the process of concertation between the actors. This often relies on a limited group of individuals who may not necessarily have a well-developed or mutually agreed idea of the activities to be carried out. Nor are they necessarily recognised within local society and their legitimacy often remains to be established. Under these conditions, three interconnected stages[1] need to be established, stages which it is important to know how to recognise, assess and support:

- Establishing a link between the actors within a network of participants facilitates the definition of a subject for discussion.
- It is on this basis that concertation in the true sense of the word may begin.
- When it is fruitful it then leads progressively to the establishment of an agreement.

The identification of ecological, social and economic issues and aspects of local power structures

A number of aspects need to be taken into consideration within the framework of this pre-evaluation phase in order to identify the issues. This pre-evaluation phase brings together the various types of assessment previously discussed (what context, which actors, what scale?).

Once a preliminary hypothesis relating to the issues surrounding the integrated management of the wetland in question has been sketched out on a territorial basis, the core group of actors needs to be assisted with an initial analysis which should enable the following to be established: the key problems, their causes, and the principal actors and interests at stake. From this analysis it should be possible to identify the main constraints deriving from this context and in particular to examine the impact of the main economic activities on the community and the natural resources in question.

1. Beuret J.-E. et al., op. cit.

Identification of the possibilities and constraints resulting from public policies, legislation and institutional processes

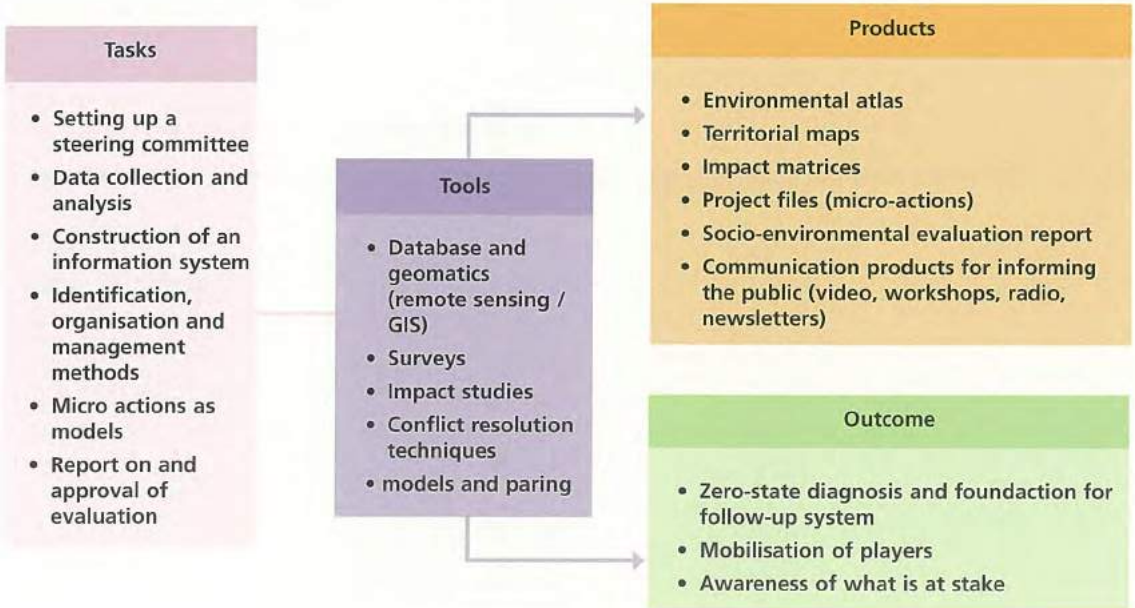
Attention must also be paid at this preliminary stage to the context created by sectoral, environmental, physical planning and centralisation policies. In particular in the first instance it will be necessary to identify the factors which could impede the process or which could on the other hand provide a useful opportunity in the establishment of a process of integrated management.

Socio-environmental evaluation and preparation for a management plan

This stage is of crucial importance. It should lead to the involvement of a very wide range of actors around the core group who originally initiated the process. This involvement should take place around a shared evaluation of the central issues in the management of the area in question. As emphasised by Denis and Henocque[1], this should not involve a detailed assessment of all aspects, with the risk of becoming lost in a confusion of details, but an overall evaluation of the state of play, concentrating on three or four central issues that have been identified during the feasibility study.

The following outline summarises the various constituent elements of this socio-environmental assessment:

The elements of the socio-environmental assessment



Source: Denis J., Henocque Y. (2001).

Denis J., Henocque Y. (2001)

The following illustration provides an example of the involvement of local communities and of general society in management of two wetlands in Egypt.

As well as involving the local populations in the concerted evaluation, scientific studies and specific surveys also need to be planned. A subsequent investment is also needed in human resources that are capable of constructing a functional information system, providing support for the actors and site users, and carrying out the appraisal at the end of the consultations. The following box details the particular importance of these factors.

The question of the organisation and leadership of this stage is also a central one. The lead group in the integrated management initiative will have to undergo a fundamental transformation[1] if it is to embark on this stage of the concerted evaluation. It needs to achieve more political and diversified representativity to ensure that the assessment phase and the courses of action which emerge from it will benefit from broad local and institutional recognition. An active core of actors needs to be built up around elected representatives. They should represent, as far as possible, the various elements of local society, each being responsible for playing a part in communicating with the appropriate organisational networks.

The composition of this group of actors is all the more important in that the evaluation phase may include a detailed assessment of the relationship of each actor to the management problems being considered. Each group will then have to play a practical part in improving its practices if they are called into question during the evaluation phase.

Drawing up a management plan

Depending on the situations identified during the socio-environmental assessment, the management plan may take a range of forms within the framework of an integrated management approach. It may result in a guideline programme for the whole of a small region, or concentrate more specifically on the management of a resource (water and its different uses), or be built up in a much more circumscribed way around the resolution of a particular problem (management of a specific wetland ecosystem).
A certain number of general principles, such as those laid down by the Wetlands Convention, are nevertheless useful to bear in mind for the successful achievement of the exercise.

1. Gorgeu Y., Jenkins C. (1997)

Involvement of local communities and general society

Omayed and Zaranik in Egypt

The Omayed site is a Biosphere Reserve, legally protected at the national level, and extends to 15,000 ha, principally comprising sand dunes and a coastal strip, a range of inland hills and plateau areas. Over the whole of the site, dense tourism facilities are spreading out over the dunes and the coastal ecosystems. The Zaranik site is a legally protected Ramsar site of 60,000 ha including terrestrial habitats, brackish marshes and the eastern edge of Bardawill lake.
The biodiversity importance of both sites is widely recognised.
To encourage the involvement of local communities in the projects, the MedWetCoast Egypt project made efforts to raise the awareness of people associated with these two sites, to involve them in the process of planning and management, and to encourage them to modify the practices employed in making use of the resources so as to reduce the negative effects on the environment.
To develop economic alternatives to traditional agricultural activities, which due to their extreme and intense nature lead to soil impoverishment, the project permitted the families on the Omayed site to buy young olive trees at a modest price. Nearly 40,000 plants were distributed to over 300 families. After planting out, an initial assessment indicated that over 95% of the plants had taken. The distribution of plants was preceded by a series of awareness-raising workshops whose aim was to train the residents in the planting and cultivation of the olive trees. The project also drew on the services of an agricultural engineer to supervise the planting, irrigation and protection of the trees. The initiative should assist in curbing hunting, overgrazing and tree felling in the protected area, diversify sources of revenue, and thereby contribute to the protection of the site.
With regard to awareness-raising, a large number of workshops were organised, both to raise awareness about environmental protection and to help to get the communities involved in the project.
At Omayed, workshops were designed specifically for the women. Clean-up programmes have also been carried out at the sites. At the same time, the work of the project has enabled community groups and NGO's to be organised (both at Omayed and Zaranik).
Finally, the development needs of the communities have been taken into account by the project, with the aim of reconciling the requirement for conservation with the necessary development of the region. At Omayed, with the cooperation of the Ministry for Water Resources and Irrigation, drinking water reservoirs have been set up for the benefit of the local communities; sites suitable for the disposal of solid waste have been identified. At Zaranik, work has been carried out with local actors (notably the El Nasr saltworks) to resolve problems being experienced by fishermen (repairs to the filtration system). Finally, a veterinary clinic has been set up at Zaranik and a campaign to publicise the issues of healthcare and treatment (both human and animal) has been undertaken.

Sylvie Goyet
MedWetCoast Project / Station Biologique de la Tour du Valat

Management plan for the Charnier-Scamandre ecocomplex: Reconciling local uses and international conservation issues

Part of the SAGE Camargue Gardoise, the Charnier-Scamandre ecocomplex is the site of one of the largest reedbeds in France (2200 ha) that is put to use in a variety of ways (hunting, grazing, reed harvesting, ecotourism). It is very valuable in biological heritage terms in that it supports a large proportion of the breeding populations of Purple Herons and Bitterns in the European Union, for which reason it is classified as a Special Protection Area in accordance with the "Birds" Directive. However, the reedbeds here have undergone appreciable degradation over the last twenty years, a decline associated with a lack of coordination in the management of the water. In order to combat this process, which is deleterious to the continuation of the usages associated with the ponds and marshes in the reedbeds, the Station Biologique de la Tour du Valat has participated with BRL Ingénierie in the production of a management plan, an exercise led by the Syndicat Mixte pour la Protection et la Gestion de la Petite Camargue Gardoise.

Study of the ecological system has enabled the causes of the deterioration to be identified. While reeds are tolerant of salt, flooding or cutting, it transpires that the combination of stresses leads to deterioration that it is sometimes difficult to reverse. In addition, ornithological studies have related the presence and density of the study species to the vegetation structure and the water management regime. As a result, there are now models that can explain and predict the spatial distribution of marshland passerines and herons in relation to environmental variables.

The socio-economic approach has also revealed the concentration of reedbed ownership as well as the ways in which the reedbed is fashioned by the various uses. The historic approach highlights a significant change in the modes of access to the resources and in management practices. Over the course of two centuries, a change has taken place from a predominantly collective form of property to a mixture of private and public property. Despite major developments in the technical field (mechanisation of reed cutting, widespread use of pumps and mechanical diggers) the customary rights (grazing, hunting and fishing) dating from the 14th century still exist on the public land. The study of the uses and management practices has therefore revealed the process of specialisation in the use of the land that has been given over to a predominant economic activity through the implementation of a succession of hydraulic works whose aim has been to increase the productivity of the natural resources being exploited (forage, reeds, game, fish). The hydraulic regime now operates on the basis of individual plots; the formerly collective management of the water is now carried out on an individual basis, resulting in turn in the fragmentation of habitats. This economic specialisation of the reedbed and its ponds, associated with a decline in water quality, is largely responsible for the degradation of habitats and the vulnerability of the species which depend on them.

Numerous individual discussions and public meetings have enabled the assessment to be approved by the users. Despite the collective acceptance of an annual schedule for flooding and for management of water depths, there are still corporate disagreements over institutional and technical solutions. The establishment of a water police as such on the local scale, combining wardening and the active monitoring of water levels, as well as the implementation of a management plan that is sufficiently flexible to respond to climatic conditions, would seem to be the keys to success. The implementation of Natura 2000, and the experimental management of some parcels of land within the framework of the LIFE Nature Bitterns programme, should enable the conditions for sustainable management of the Charnier-Scamandre ecocomplex to be made clear.

Raphaël Mathevet
Station Biologique de la Tour du Valat

Eight general principles for an integrated management approach[1]

- Control the intensity of uses or activities in the wetland so as not to exceed the carrying capacity of the resources, by deciding on the resources which can be exploited with no risk of degradation or impoverishment and those which need to be renewed or reconditioned for the purposes of a new, rational utilisation;
- Respect natural processes, encouraging beneficial processes and preventing unfavourable activities;
- Reduce the risks facing vulnerable resources;
- Take care to preserve the biological diversity of coastal ecosystems;
- Encourage harmonious rather than conflicting activities;
- Ensure that the environmental, social and economic objectives are achieved, at a cost that is acceptable to society;
- Protect traditional rights and forms of use as well as fair access to resources;
- Resolve sectoral problems and conflicts.

On a more practical note, Denis and Henocque[2] describe an approach that is based on seven points and a precise and usable system of tasks, tools, products and anticipated results for this phase of the production a management scheme.

- A definition of the zone involved and its specific territories, based on the results of the environmental assessment (biotas, resources, activities, institutions);

- The top priority issues, defined by a consensual agreement, which will act as guidelines for study and discussion by interconnecting the various issues and enabling the group to approach them coherently;

- The main guidelines for the drafting of the plan (national/local levels of governance, adaptation, spatial implementation, etc);

- A presentation of the overall goal or goals and its spatial breakdown depending on the milieu (river, wetland, mangrove swamp, lagoon, reef, urban area, etc.) and territory (territorial units);

- Locations where action will be taken, and the prioritised list of actions selected for the short and medium term (about 5 years) as well as the projects for which outside funds must be sought;

1. Convention de Ramsar (2002) *2. Denis J., Henocque Y. (2001)*

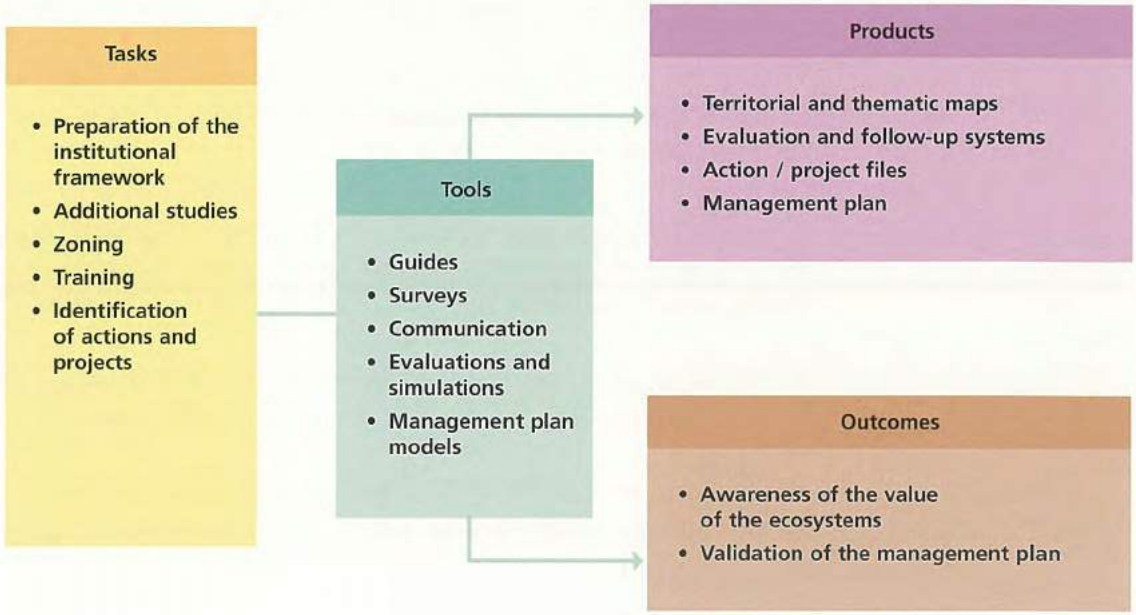
• The type of monitoring and evaluation which is planned and the main steps involved in the implementation of the entire plan

• The institutional framework (management and monitoring structure of the project), funding sources, a timetable for achieving the goals, and an outreach strategy.

The box on opposite page illustrates the main guidelines that have been followed in the context of a management plan based on the catchment area of a wetland.

The elaboration of management plans based on an integrated approach needs to take into account support for initiatives that stimulate and invigorate the territorially-based project. While in order to be effective it is necessary to be systematic, care must be taken to ensure that the chosen objectives, and the actions deriving from them, take particular account of community-based initiatives[1]. Attention needs to be paid in this context to promoting and developing "ecology-economy" initiatives (organic farming, ecotourism, rational

Elaboration of the management plan



Source: Denis J., Henocque Y. (2001).

1. "livelihood challenges" notably in less favoured regions where the sustainability of efforts undertaken to improve local modes of resource exploitation may not be guaranteed if family incomes or even food security are not improved.

hunting, etc.), as shown in the example from Jordan on following page. In the same way, some social investments which may correspond with local demands (schools, health, etc.), should not be dismissed; they may offer a good way to support local involvement without which the plan will remain a purely technical exercise.

The organisation of this stage should allow the steering committee in charge of drawing up the management plan to rely fully on "proposition commissions". As described by Gorgeu *et al.*[1], these committees have the role of discussing and working on the three or four issues defined at the end of the socio-environmental assessment.

A management agreement for a Mediterranean wetland

The Syndicat Mixte de Gestion de l'Etang de l'Or (SMGEO) initiated a "bay agreement" in 1996. This agreement was established for 5 years with the aim of protecting and developing the hydrological basin of the Etang d'Or and its tributaries.
It is a programme of coordinated, large-scale and concerted activity, which conforms with the 5 objectives of the SMGEO:

- Improving the water quality of the lagoon, with actions including for example an ambitious programme of works to improve and modernise the purification systems and treatment stations. The required investment is provisionally estimated as 24 million Euros.
- Upkeeping the watercourses in the catchment area, whose beds and banks support a wide range of animal and plant species. Dotted with works of art, they constitute an ecological, landscape and architectural heritage to be preserved and displayed. As an example of activities, the 'bay agreement' calss for the removal of old factory and visible nuisances, and of the silt that impedes the movements of fishing boats along the Lunel canal.
- Managing the marshes, which play an essential role in the regulation of floods and the purifying of water. They provide high quality habitat for many animal and plant species and are the site of a range of human activities. Safeguarding their natural, wild character needs to be reconciled with the wishes of all the users, by means of concerted local management plans. As an example of the actions specified in the agreement, 'cabanes' (small summer houses typical of Southern France) that do not conform with legislation and constitute a nuisance must be made to conform and must be integrated within the site.
- Understanding the inter-connectivity of the lagoon with the sea, the channels and the watercourses is important for optimising the management of the hydraulic works, and is vital for planning appropriate activities and developments. These studies are included in the agreement.
- Providing information to the communities of the lagoon, the area surrounding it and its catchment area is achieved through programmes of information and awareness-raising among the community and the users of the area, in the form of public meetings, exhibitions, site visits, etc.

Christine Navarro, *Association Verseau*

This contract was signed in July 2003 by the Conseil Général de l'Hérault[2], the Conseil Régional Languedoc-Roussillon, the Préfecture de l'Hérault and the President of the SMGEO.

1. Gorgeu Y., Jenkins C. (1997)

2. In the concertation phase of the agreement, the Conseil Général played a particularly active role.

Promotion of activities linking ecology and economy in management plans

The example of the Azraq Oasis (Jordan)

The Azraq Oasis is located in the Jordanian desert, 58 kilometres east of Amman, in the northern part of the Great Arabian Desert region. At the junction of basaltic formations in the north and limestone outcrops in the south, the Azraq Oasis is the only permanent water source in the region.
There has been a human presence at Azraq since ancient times, very strongly associated with the site's unique character and the presence of abundant springs. It marks the eastern boundary of the Roman Empire, and there are many Roman, Byzantine and early Islamic remains in the reserve.

The importance of this wetland has been increasingly recognised since 1922, and protective legislation was enacted in 1938, 1963 and finally in 1965, the year during which the site was accorded National Park status. Its designation under the Ramsar Convention took place in 1977, and the site was subsequently classified as a Wetland Reserve by the Jordanian Royal Society for the Conservation of Nature.

An initial management and development plan for Azraq was established in 1978, to be followed by a more practically-orientated management plan whose objective was to achieve improved conservation of the site and its rational use by the local communities. Nevertheless, from 1983 the first extractions were undertaken to meet the demand for water, as the result of which the oasis dried out completely a few years later, with a 12 metre fall in the water table.
It is for this reason that in 1992, a project funded by GEF (Global Environment Funds) was launched, with the principal objective of restoring habitats representative of the original wetlands of the Oasis.

The establishment of a reserve employing 8 staff on the site marks the culmination of this project. The employees run the visitor centre, undertake activities to publicise the site and increase the environmental awareness of the public, and manage a local development project.

The residents of the area benefit both directly and indirectly from the oasis. The direct benefit mainly involves the employment of local people in the management team. The indirect benefits relate to the purchases carried out locally by the reserve, as well as the work that is contracted out to people from local communities, in particular all the maintenance work.

Microprojects of a socio-economic nature have the objective of compensating local users for their losses associated with the intensive use of the wetland, which was in any case the root cause of its disappearance. There have been tangible results and 8 such projects are currently being carried out on the site, employing a total of 22 women. Products that come from the wetland and are linked with nature conservation are made and sold as part of these projects: bags made from natural materials, Azraq salt, toys and cooking utensils made using reed.

In future the RSNC plans to delegate all responsibility for the monitoring and management of these projects at the Azraq site to local committees, in order to generate additional monetary revenue for the region through the medium of nature conservation

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The Royal Society for the Conservation of Nature of Jordan

Christian Perennou,
Marc Lutz,
Station Biologique de la Tour du Valat

Their task should be:
- taking up the assessments and proposals from the preceding phase,
- critical study, searching for ideas, taking account of existing systems,
- establishing directions and defining themes for activity within a territorial approach,
- making proposals regarding the resources, skills and networks to involve;
- outlining the types of activity to be undertaken and supported.

These committees should be open to elected representatives, social and occupational groups, activists from associations, representatives from bodies and organisations directly associated with their aims, and any other interested persons.
It is on the basis of the work of these committees that the steering committee will subsequently produce summaries that will enable the management plan strategy and activities, the territorial charter or the management agreement to be defined.

Conditions to be fulfilled for an integrated management approach

To conclude the description of the elements of an approach enabling to integrate"human activities in an environmental system"and "defining socially specified objectives and attaining them over the short and long term", we are presenting four essential conditions highlighted by Margerum and Born[1] in their definition of Integrated Management of the Environment:

- It should be inclusive and to that end should allow for an overall view of the environmental problem and of the whole range of functions of the ecosystem affected by the problem in question.

- It should generate interconnections, environmental problems being too complex to be understood in their entirety without addressing the interactions between the sub-systems. It is therefore crucial to involve all the actors affected by the problem in question.

- It is important to define common objectives. The parties and actors involved should define a common future that will enable intermediate, partial or individual objectives to be transcended.

- It is necessary to be selective concerning the activities to be implemented. It is important to choose the most urgent actions in order to achieve the socially defined priority objectives.

1. Margerum R., Born S. (1995)

What organisations and structures to lead and promote such a process?

The establishment of lead organisations that widely involve the key actors in local management is a crucial factor in the success of the process of integrated management.

The approach outlined above aims to enable the progressive appearance of a legitimate authority that can direct the process of integrated management.

The overall structure[1] of the approach described by Denis and Henocque[2] shares a gradual process of institutionalisation in which the "pioneer group" gives way successively to the "pilot group" and then a "steering committee", to arrive finally at a "co-ordination structure" responsible for implementing the decisions. The bodies responsible for the integrated management of wetlands emerge from the process of negotiation, and so it is not possible to define their forms or content in advance. They will have to take into account the commitment of the actors, which is achieved through the concertation initiative, and subsequently to involve them as closely as possible in the decision-making process. The experience of the Regional Natural Parks in France shows that the transformation of the pioneer group (often association-based) into a coordination structure (of local government type) brings up political issues and may give rise to opposition and to serious disputes on the local level.

The steering organisation in a process of integrated management may take a range of forms, depending on the institutional context of the country concerned. The following examples provide a sample of this range of forms. It may be a group for inter-Communal monitoring of the management of an area, organised around an appropriate action plan and strongly underpinned in its activities by an adequate level of awareness. There may equally well be recourse to a committee like that set up in the case of the Tyre Coast Nature Reserve in Lebanon (see box on opposite page).

1. See figure page 115.

2. Denis J., Henocque Y. (2001)

Organisation to mobilise the parties involved

Tyre Coast Nature Reserve in Lebanon

The Tyre Nature Reserve is a coastal area close to the historic city of Tyre, in southern Lebanon. The site, which extends to 380 ha, was declared a nature reserve by law in 1998. The site was listed as a Ramsar Site in 1999 and as an IBA[1] by BirdLife International. It includes a beach with sand dunes, agricultural fields, and artesian wells which supply reservoirs constructed in Roman times, whose overflows run into the sea, creating freswahter and salfwater areas and a small wetland ecosystem used by migratory bird species. Preliminary surveys have recorded a large number of species: 74 different species have been counted, and it is probable that the total will rise to 300 species by the time the inventory work has been completed. The site is also an important breeding site for turtles, *Chylonia mydas* and *Caretta caretta*.

The MedWetCoast Lebanon project began at Tyre at the start of 2003. At this time a site administrator was appointed, enabling the management structures for the site to be strengthened and practical activities to be undertaken.

In Lebanon, the management of protected areas is the responsibility of GACs *(Government Appointed Committees)*. The GAC is a committee appointed and supervised by the Ministry of the Environment to ensure that the interested parties and local actors are involved in the management and protection of natural sites, an innovative system that should result in greater flexibility and durability among the official site management bodies.

The Tyre committee includes representatives from the main organisations that operate within the territories bordering the nature reserve: the city council, local government, the relevant government departments such as the Ministry of Agriculture, and local NGO's, who form a committee of 5 members who each sit for 4 years, all on a voluntary basis. Specific tasks are assigned to each member of the GAC: chair, general secretary, treasurer, technical advisor and administrative support, on the basis of terms of reference which deal with administrative tasks, supervision, and planning and financial responsibilities. The Tyre GAC receives around 80,000 $ each year from the government for the management of the protected area, salaries and a proportion of the running costs. In addition, the city council contributes about 20,000 $ every year for the use of the beach that is situated within the reserve.

The project has enabled the GAC to become more active, with an increase in the frequency of its meetings (up to 3 times per month). Some of the activities undertaken under the aegis of the GAC include: bringing back the tourist kiosks on the beach to 110 m behind the waterline, reducing the number of kiosks from 86 to 58, fencing off and complete protection of the conservation area, and protection of the water supplies by promoting organic farming and the more efficient use of water.

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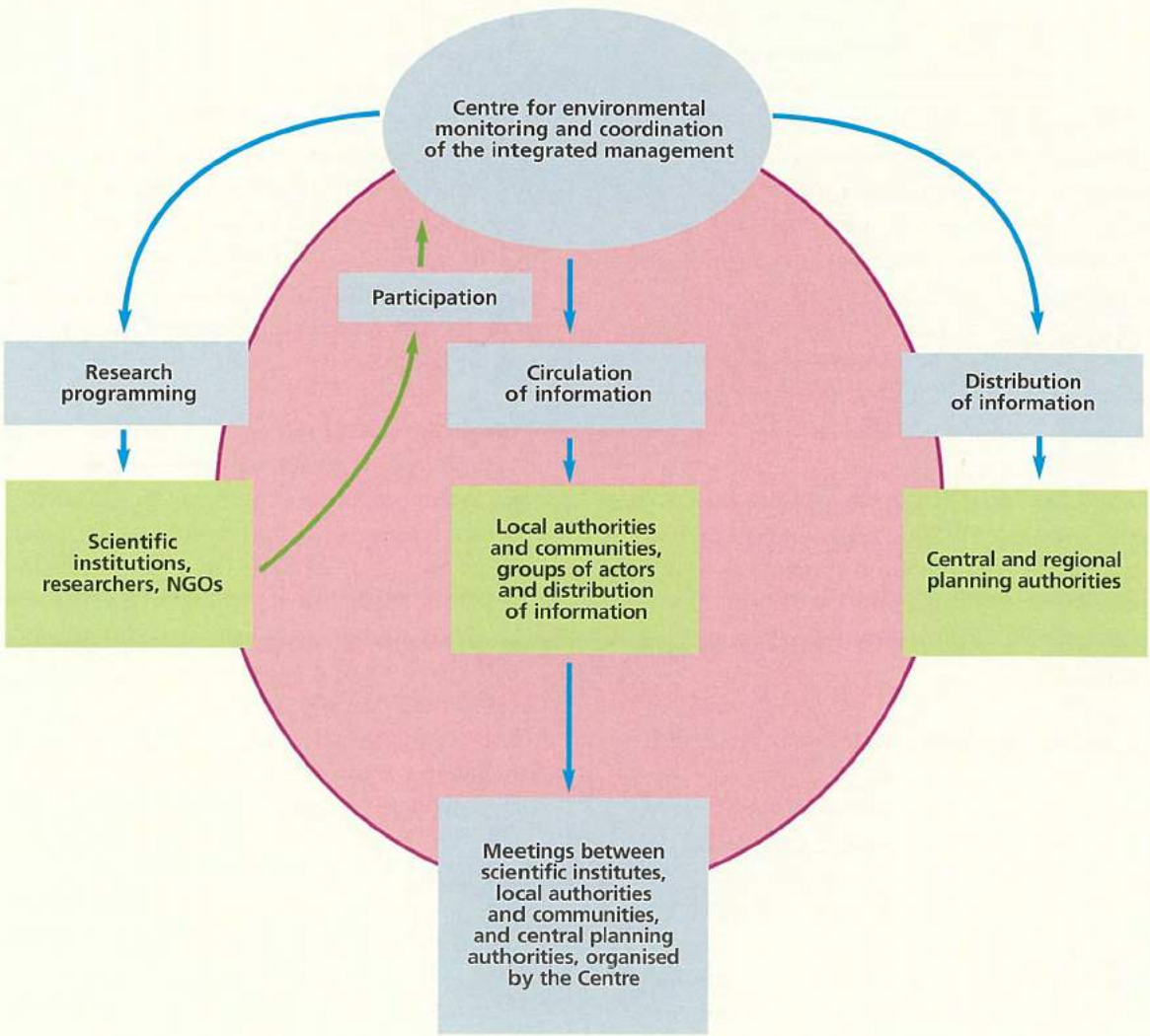
1. IBA: Important bird areas

The following diagram outlines the case of another system that operates in Greece.

There may be recourse to a "Syndicat Mixte" uniting several Communes to produce a territorial charter. This is the case of the type of management selected by the institutions participating in the territorial charter for the sustainable development of the Haut Béarn (see box on opposite page).

Organisation of an integrated management system in Greece



Source: Pergantis P. C. (1988).

An example of organisation: the production and implementation of a sustainable development charter

Valleys of the Haut Béarn in France[1]

The Charter constitutes an agreement, relating to the whole of the valleys of the Béarn, by which the signatories undertake, on the basis of an agreed strategy, to carry out a certain number of activities leading to the sustainable development of the valleys of the Béarn as well as to the protection and, in a possible second phase, augmentation, of the bear population.
This agreement brings together the State, the Region, 16 Communes within the valleys of the Béarn, the Association of Transhumant Stock-Rearers and the Departmental Hunters' Federation. These are the co-signatories of the Charter.
All of the co-signatories undertake to establish suitable bodies to promote the harmonisation of projects within the fields of agro-pastoralism, silviculture, hunting, and bear protection.
Five-year plans, resulting from discussion and dialogue involving all the contributing parties and based on an initial base line diagnosis and periodic assessments, set out the medium-term objectives as well as the resources necessary for their achievement.
The implementation of the Charter requires the establishment of an institution by means of which all the partners can continue to be represented and to take real responsibility for the development of the valleys of the Béarn and the protection of the bears.
The Haut-Béarn patrimonial institution includes:

- a Syndicat Mixte.
- a patrimonial management council
- a management team.

The Syndicat Mixte, a decision-making body. It is established by the Region, the Department, and 16 Béarn Communes. It may be open to others who express a wish. It puts the charter for the sustainable management of the valleys of the Béarn and the protection of bears into practice, particularly by drawing up long-term programmes following the recommendations of the patrimonial management council and by negotiating all the necessary administrative agreements with the Communes which own the land and with the various categories of land users. The Syndicat Mixte organises the involvement of elected representatives, sets action programmes, and comes to decisions based on the recommendations of the patrimonial management council.

The patrimonial management council is a body for discussion, concertation and putting forward proposals. It is responsible for monitoring the implementation of the Charter. It advises on the long-term programmes, on their stage-by-stage evaluation, as well as on all the management decisions other than those relating to the internal functioning of the Syndicat Mixte and to infrastructure projects or works affecting the Haut Béarn valleys.
The council is made up of three colleges: the college of elected representatives (Communes, Department and Region), the college of the inhabitants of the valleys (shepherds, hunters, nature protection associations, forestry organisations, chambers of commerce: agriculture, crafts, business and industry, trades and tourism), the college of qualified people (State administration and public corporations, Sub-Prefect, DDAF, DIREN, ONF, ONC – departments of the conseil général, régional, general and regional councils, Pyrénées National Park, "resource persons" appointed for their scientific knowledge or their practical experience).
The patrimonial management council is supported by technical committees who prepare written reports.

The management team. Its role is to be available to the Charter partners, to produce reports, to implement the decisions of the Syndicat Mixte, to assist and facilitate. The management team takes forward and implements, administratively and technically, the decisions made by the Syndicat Mixte and acts as secretariat to the patrimonial management council. It comprises a permanent member responsible for all matters relating to bear protection, a permanent member responsible for planning research and producing reports, a technical member responsible for agro-pastoral issues, and a secretary.

1. Syndicat Mixte du Haut Béarn (nd)
2. DDAF: direction départementale de l'agriculture et de la forêt ; DIREN: direction régionale de l'environnement, ONF: office national de la forêt ; ONCFS: office national de la chasse et de la faune sauvage

How to progress from organising to a role of mediation?

In view of the social and economic issues highlighted during the evaluation phase, and of specific interests which may emerge depending on the management decisions, it will be understood that directing such a process goes beyond organisation to include an essential function of mediation.

It is therefore important to lay particular emphasis on the tools that best enable this role of mediation to be fulfilled.
Tools of "social observation" are described by Kalaora[1]. The "monographic method" would appear to be most appropriate for this comprehensive approach: "monographs" of professions, Communes, Regions or even countries. "Monographs" of professions and businesses are necessary in order to understand the activities involved, their relations and mutual responsibilities, the institutional constraints, the skills and knowledge employed in different professional fields, the actors' ideas about the future of their own and others' activities, attitudes to the natural environment, perceptions of the impact of human activities on resources, the positive or negative initiatives undertaken to maintain the levels of the resources. In other words, it involves "understanding the different professional worlds, be they specific fields or multiple activities, at issue in the management of a natural resource, and the interactions between these worlds, whether positive or contentious."
"Tools for the representation of reality" are particularly useful in a mirror-mediation situation. Without embarking on an exhaustive discussion, four types may be mentioned[2]:

- "Photographic representation": aerial photographs may help raise the question of the management of the land among the community, especially farmers.

- "Spatial representation": maps illustrating the uses to which the land is put, the recent history of these uses, the whereabouts of sensitive areas, the advance of urbanisation, etc., can be put to good use in the initiation of dialogue.

- "Representation of a set of actors": this tool is used in a specific way here. It involves bringing out the position of each category of actor to show that no actor can be assumed to be acting in bad faith and to show that the assertions of each are worthy of respect. After

1. Kalaora (2000) *2. Beuret J. E., Trebet C. (nd)*

that the points of conflict are brought out so that they can be "aired coolly" (dispassionately), and then the germs of compromise appear, which can form a point of departure in the search for agreement.

• "Long-term representation": the presentation of extreme scenarios (all-tourism, all-agriculture, while ensuring that it does not result in caricatures), may be used for a territory whose attractiveness derives from its heritage value as much as from the quality of its arable/forestry/pastoral areas, to highlight the fact that the actors all need each other if they are going to be able to continue with their activities.

Finally, some organisers acting as mediators may have recourse to the technique of reformulation to force their interlocutors to argue their case and justify their position.

Modelling tools also have their uses for mediation. By bringing together all the territorial aspects, multi-agent modelling provides an aid to mediation that is of particular use in an effective interdisciplinary dialogue. It enables a number of contrasting economic scenarios to be simulated and different modes of access to

Multi-agent modelling[1]

This includes socio-economic, ecological and spatial aspects within a single model. A multi-agent model therefore provides a tool for simulating actor-environment interactions within a virtual territory.

The desired result is to provide answers to the following questions:
• In what ways is specialisation of land use (habitats) harmful to biodiversity? On what scale? Are there threshold effects?
• What is the impact on biodiversity of the frequency of changes of use (resilience of ecological and social systems)?
• How and at what level of organisation should action take place to achieve the effective conservation of reedbeds and their fauna[1]?

The level of organisation selected for modelling is that of the functional hydrological unit, as an individual unit of decision.
An ecological model (hydrology, plant and animal processes) is combined with a socio-economic model (marketing of reed and management of the habitat by various social agents with differing objectives, beliefs and access to information). Applied to a wetland, the model enables a simulation to be carried out of the developments taking place in the reedbed and among its associated bird populations as a result of interactions between the decisions and management practices of the site users.
This model is designed to be used in land development and as a support for assisting with decision-making.

1. Mathevet R., Mauchamp A., Lifran R., Poulin B., Lefebvre G. (2003)

Sand dunes in Tyre (Lebanon)

Medwetcoast Lebanon

wetland resources to be explored. In the context of sustainable development, these simulation tools have the advantage of revealing possible changes, giving a more practical dimension to the issues of sustainable management. They may also help with collective decision-making in complex situations[1].

In all events, the mediation role to be undertaken by the promoters of an integrated management initiative does not come into being spontaneously. It requires very specific abilities and skills, as summarised below:

Abilities and skills of a mediator[2]

- Strong capacity for listening,
- Ability to stand back and be objective: to go from involvement to distancing oneself,
- Understanding of the economic, political and cultural issues affecting the countryside,
- Familiarity with organisation and communication tools,
- Mastery of the languages used by the local actors,
- Charisma,
- Ability to defuse a situation,
- Ability to put interlocutors at their ease, to encourage them to formulate and set out their points of view, and develop their arguments and suggestions.

1. Bousquet F., Barreteau O., Le Page C., Mullon C., Weber J. (1999)

2. ENSAR-Laboratoire SPDR (nd)

How to strengthen capacities for governance among those responsible?

Promotion of "round table" governance

The form of governance for which these integrated management approaches wish to strive is that of a "round table", that brings together different categories of actors: elected representatives; actors from the economic, social, voluntary or administrative sectors; employers, managers or financiers[1]. The power that is exercised consists in giving a direction to the actions of each one with reference to the founding document that is constituted by the management agreement or the charter. This local power has to harmonise the activities and modes of activity of all, and then to keep watch over this harmonisation.

A demanding and fragile governing power

The type of power exercised in a process of territorial governance is both demanding and fragile. It is necessary constantly to plan activities that are far removed from those which are normally carried out in the realm of the governance of political institutions. Gorgeu *et al.*[2] base this governing power on the following points:

- The act of governing, not administrating,
- Power by agreement, not by statute,
- Management based on a shared vision and friendly relations, not a set of financial and legal processes,
- A legitimacy that is morally-based, not derived from direct or even indirect suffrage,
- An acknowledgement of a mission, not a delegation of competence
- A founding document, not laws,
- Human skills in negotiation, not in enforcement,
- A system based on overcoming divisive tendencies, not based on influence and the balance of power.

The strength and permanence of this power is strongly dependent from the outset on the quality and the standards applied to the initiation of the shared project in the area in question (as established in a charter, a contract or any other agreement), and on the strength of the "cement" represented by the founding document. It is then necessary to continually maintain, reactivate, and strengthen the commitment to the integrated management project. The legitimacy of a charter or a management agreement derives essentially from its public character. The whole issue is to succeed in "giving public force" to the agreements and undertakings that it sets out. But it is still necessary

1. Interview of the president of a Parc Naturel Regional in France, cited by Gorgeu Y. (1999)

2. Gorgeu Y., Jenkins C., Gentil A. (1997)

that this force can be sustained and strengthened over time. To this end, commitment must be based both on a territorial legitimacy and probably also on an external legitimacy.

Territorial legitimacy

This is legitimacy that is established from within the territory itself. In addition to the number and diversity of signatories, as well as the solemn formalities of the deeds of commitment, three important factors are essential to ensure legitimacy over time:

- The scope and continuity of public debate and active communication. The charter needs to be brought to life for a wide range of actors and residents. Meetings, exhibitions, rallies, events, involvement of schools, newspapers, publications... such is the varied range of methods appropriate for various different target groups.

- Making clear the commitments deriving from the charter for each category of signatory as the programme unfolds. On the basis of the founding document, specific agreements should be elaborated that will set out the details of the undertakings and actions required to address this or that aspect of the programme. The charter needs to be kept alive through these specific commitments with respect to the life of the territory and the founding text. The charter does not mark a single moment but rather takes shape over time.

- The support and commitment of administrative, professional and social partners who are highly active within the territory. These partners may be the State, the Region, Departments, private, public or public-private companies, the tourism industry, etc. What is involved is the creation of the conditions for a balance of power that is favourable to the territory.

External legitimacy

This derives from recognition on another level – regional, national or even international. Recognition afforded by an accepted authority on the basis of elements for evaluation that may be combined with quality criteria. For example, the recognition of the Regional Natural Parks in France through the awarding of their national Ministry of the Environment status, registered at the INPI (National Industrial Property Institute), confers a legitimacy that is proving to be essential for sustaining such a policy over time. Elsewhere, the acquisition of status such as that of Biosphere Reserve may enable the local actors to acquire a certain external legitimacy

C. Perennou / Tour du Valat

Aiguamolls de l'Emporda,
a Ramsar site in Spain

External legitimacy may also be based on legislative or regulatory measures that give the terms of the charter a legal power, i.e. create an obligation to conform with them. It is certainly necessary to strike a balance here between the moral and functional aspect of the charter and a limited legal aspect to the commitments on which the legitimacy of a charter is based.

The following example illustrates this search for a balance between internal and external legitimacy for the management system being implemented.

Linking the decision-making body and the consultative body for the integrated management of a lagoon in France[1]

The creation of the lagoon management body, the Syndicat Mixte de gestion de l'étang de l'Or, resulted from a Departmental initiative whose main objectives were the monitoring and management of the lagoon. It is the wish of this management body to take a global view, to discuss and reconcile the wide range of uses and conflicting interests. It is formed from a Syndical Committee and a Consultative Committee (arena for decision and arena for consultation).

The actors who form the committees belong to several voting colleges.

- A syndical committee playing the role of a decision-making body, formed of elected representatives and/or councillors from the regions belonging to the organisation. It consists of an elected President and delegates from Communes or communities or Departments that have a certain percentage of votes, as established by the constitution.
- A consultative committee consists of three colleges of territorial actors:

– Representatives of the national public authority (Regional Environment Directorate, Departmental Agriculture and Forestry Directorate, Departmental Amenities DirectorateDirectorate, SMNLR, Affaires Maritimes, ONCFS, National Forestry Office, Water Agency and CELRL).
– Representatives from public territorial agencies, nominated according to their roles and the issues identified on the site that merit their participation. (Conseil Régional, AME, Cépralmar, Conseil Général, Departmental Tourism Committee, EID Méditerranée, Chamber of Agriculture, Departmental Hunters' Federation, Departmental Fishing Federation, etc.).
– Representatives of civil society and social and occupational groups (stock breeders, fishing conciliation boards, fishing associations, Communal hunting associations, environmental protection associations, qualified experts, SAFER (rural land and development PPPs), residents' associations, local scientific and technical committees, etc.)

This consultative committee is organised into thematic working groups in which certain members of each college take part, led by a mediator.

1. Navarro C. (2003)

What should be the role of the State in support of these initiatives?

The aspects of the initiative which have been discussed above, and the examples given, have clearly revealed the omnipresence of the involvement of State departments, particularly their technical input and their role of mediating between local actors. The State is also very often a signatory to national or international commitments that place the emphasis on wetland conservation. But it is necessary in conclusion to stress the more determined commitment to be expected from the State in the promotion and active support of the integrated management of Mediterranean wetlands. This commitment should favour three aspects in particular which in many situations necessitate radical institutional and legal reforms:

- The integration of conservation into public physical planning policies. The example from Tunisia on following page clearly shows the links that the State needs to establish, in its public policies, between biodiversity conservation, physical planning and the management of water resources.

- Adaptation of legislation to encourage decentralised processes and systems for the management of land. This is not simply a question of promoting the establishment of local bodies to strengthen the local capacity for managing public facilities. It also involves facilitating an opening up of institutions to management systems that integrate the different users and actors concerned in the sustainable development of wetlands (social and occupational groups and actors from civil society). On the legal level, the responsibility of the State is to initiate, to develop and create legislation that supports integrated wetland management initiatives without stifling them. Legislation which it is the responsibility of the State to devise and oversee must often be tailored in order to genuinely enable the local actors to enter into a process of concerted management. This adapting of legislation should promote a more effective implementation of protective measures which are necessary for public as well as private land in Mediterranean wetlands. The Moroccan example of page 139 illustrates the kind of developments to be encouraged.

Integrating biodiversity conservation into water policy

Lake Ichkeul in Tunisia

Tunisia has a wide range of instruments for protecting the environment and biodiversity. The Forest Code of the General Directorate of Forests, revised in 1988, makes provision for nature protection and various types of protected area status; there is a paragraph specifically dealing with the conservation of wetlands. In addition, there is a code for land development and urbanisation which requires environmental impact studies to be carried out. Tunisia has a national biodiversity strategy, a biodiversity action plan, a national Agenda 21 for sustainable development, and the potential for implementing Agendas 21 locally. Agencies have been created for the protection of the environment and the protection of the coast. There are overarching organisations for coordinating activities and for integrating the environment into sectoral policies. Examples are the National Commission for Sustainable Development and the Interministerial Committee for Physical Planning.

Despite all these tools dating from the 1990's, the Ichkeul National Park has been included on the UNESCO list of endangered World Heritage areas since 1996. Lake Ichkeul is a Mediterranean coastal wetland. Added to the Ramsar Convention list in 1980 (and to the Montreux register in 1990), declared a National Park in the same year, a UNESCO Biosphere Reserve since 1977 and classed as a World Natural Heritage Site, the site clearly has a wide range of legal protection. However, the construction of several dams in the catchment area of the lake has caused a severe fall in the water level in what was already a naturally shallow lake, resulting in an increase in salinity, alteration of habitats and a decrease in the use of the site by migratory waterbirds.

While the legal and political instruments set up in the 1990's arrived too late to contain the impacts of the water policy on protected areas like Ichkeul, they have nevertheless enabled, quite recently, Lake Ichkeul to benefit in its own right from the overall hydraulic network, after allocation to the urban populations, agriculture, industry and tourism. Integrating biodiversity conservation into a public policy for water, a priority in Tunisia, is an advance that will perhaps be able to help to put a stop to the degradation of the Ichkeul site.

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1. Agenda 21, recommendations for the 21st century, Rio de Janeiro summit

Adapting legislation in favour of integrated management

The Merja Zerga lagoon in Morocco

The Merja Zerga lagoon is located on the Atlantic coast of Morocco, close to the small urban centre of Moulay Bousselham. The fact that the lagoon opens onto the sea allows interchanges to take place between the sea water and the fresh water, creating a wide variety of habitats. This variety means that the lagoon is one of the important Mediterranean sites for migrating and wintering waterbirds, especially as the lagoon is one of the best-preserved wetlands in the Mediterranean basin.

The Merja Zerga lagoon has been a biological reserve since 1978. It has been listed as a Ramsar site since 1980. Its management is the responsibility of the Moroccan Water and Forests Administration (AEF) which is in charge of the protection of biodiversity within the country. The AEF is faced with several problems in the reserve, in particular: a population increase and increasing pressure on the lagoon's resources, and the dominance of the collective land-holding system. In this context and in the knowledge that the classification as a biological reserve does not confer any legally protected status, the AEF has no capacity to act. At present, its only avenue is the possibility of recourse to the hunting laws, which are inadequate in terms of the conservation of the site.

However, other types of organisation also contribute to the protection of the reserve. For example, the Kenitra urban agency, which is in charge of carrying out the urban development programme for the centre of Moulay Bousselham, has planned for special measures (areas that are *non-aedificandi* and low-density residential areas) within the central zone included in the reserve.

Secondly, and on a national scale this time, in 1996 the AEF initiated a major study of the protected areas, which should shortly lead to legislation in this field. New status, such as Nature Reserve, Nature Park, or State Biological Reserve, should emerge and enable the inhabited areas to be protected and managed, as a complement to the already existing status of National Park. Accordingly, 160 sites including the Merja Zerga lagoon have been identified as areas of biological and ecological importance, and they should be awarded one of these status designations over the next 10 years. These two initiatives, on two different scales, are vital steps towards improved management of the Merja Zerga lagoon: they will enable the authorities in charge of managing the protected site to implement more effectively the necessary protective measures on both the collectively owned and the private lands within the reserve.

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The role of States in the cross-border Prespa Park, the first cross-border protected wetland in south-east Europe

Lakes Mikri and Megali Prespa are situated in the western Balkans, on the borders of Albania, Greece and the former Yugoslav Republic of Macedonia.

These high-altitude lakes are surrounded by wooded areas, the total catchment area of the lakes extending to about 2,500 km and altitudes rising from 850 metres at the level of the lakes to over 2,600 metres on the surrounding summits.

The Prespa lakes are among the most ancient in Europe, and are internationally famous for their biodiversity, with populations of endemic fish and important populations of rare and threatened birds – Mikri Prespa supports the largest colony of Dalmatian Pelicans *Pelecanus crispus* in the world. Rare mammals such as Brown Bears are also found here, and over 1,500 species of plants have been recorded in the whole of the catchment area. Protected areas and areas in which activities are controlled extend over a large proportion of the basin and include a National Park, a complete ornithological reserve and two Ramsar sites.

Human habitation at the Prespa lakes dates from prehistoric times, and for this reason the site's cultural heritage enhances its value and attracts many visitors, with monuments dating from the Byzantine and Ottoman eras as well as picturesque villages. At present the region is rather thinly populated with a total population of about 25,000, most of whom make their living in the primary sector. The coexistence of man and nature has fashioned the landscapes and ecosystems and has allowed the natural assets of the site to be conserved through the continuation of traditional activities.

The role of the States in the cross-border processes

Conscious of the need for a joint approach by the three countries for the conservation of the natural and cultural assets of the whole of the Prespa Lakes basin, the Greek government, represented by the Prime Minister and in response to a proposal from the Society for the Protection of Prespa (SPP) and WWF Greece, invited his Albanian and Macedonian counterparts on 2nd February 2000 to the village of Aghios Germanos, to produce a joint declaration on the establishment of the Prespa Cross-border biosphere reserve.
A few months later, under the aegis of the Ramsar Convention, a Prespa Park Coordinating Committee was set up, including representatives from central government, local councils and environmental conservation NGOs from the three countries, as well as representatives from the Bureau of the Ramsar Convention and the coordination unit of the MedWet initiative.

This committee became operational in 2001, and since then has met twice per year. It facilitates a climate of rational cooperation and mutual trust among all the participating parties from the various countries, and has enabled procedures to be drawn up for carrying out joint activities and achieving the objectives of the Prespa Park. One of the most important achievements of the committee has been the production and endorsement of the strategic action plan (SAP), which incorporates a shared vision for the site. The SAP was produced by experts from all three countries, and was the subject of widespread consultation with local actors on all levels.

Subsequently, it has also been possible in 2004 to set up a large project), thanks to GEF (Global Environment Facility) funding via the United Nations Development Programme (UNDP) and the German Bank for Reconstruction (KfW), with additional co-funding from the three countries.
The objective of this project is to integrate the protection and management of the ecosystems of Prespa, with particular emphasis on the sustainability of human activities and the participation of local communities.

It should be noted that the establishment of the Prespa Reserve has also acted as a catalyst in the development of contacts and collaboration between the local actors from the three countries, via their elected representatives, the authorities responsible for environmental protection, primary schools and colleges, as well as professional associations, etc.

Following a long period of isolation and mistrust resulting from the Cold War, the Lake Prespa communities are now in a position that is favourable for collaboration and for the participation of all in defining together the desired future for their land.

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Société pour la Protection de Prespa

Marc Lutz
Station Biologique de la Tour du Valat

Prespa lake

J.-P. Taris / Tour du Valat

• Strengthening of cross-border processes for management and development. Situated by the side of a shared sea, many wetlands have a cross-border nature, whether as a direct result of territorial divisions or indirectly, due to the movements of species that have access to wetlands belonging to different countries. Co-operation between States is therefore essential for the viable management of the wetlands. This final example from south-east Europe shows how different States have been able to actively facilitate the process of managing cross-border wetlands.

Constraints, risks and opportunities

Some constraints and risks...

Having stressed the pertinence of these approaches and described their principal tools, it is important to point out the principal risks and constraints that should be taken into account as they are being applied to Mediterranean wetlands.

Time and resources required for the integrated management process

The concertation undertaken during these integrated management processes may appear to be demanding and time-consuming, to the detriment of the basic work of the organisations who wish to promote the initiative. Discussion may also appear to compete with activity. It is therefore important that sufficient time and resources are allocated to carry out this process satisfactorily.

Legal vagueness may cause concern among elected representatives with regard to responsibilities

At many stages in the processes of integrated management it is necessary to depart from formal and procedural relationships in favour of making room for discussion, negotiation and shared creativity. This means that in the first instance the uncertainties associated with a lack of understanding of the legal framework among the various parties involved should be resolved. Co-operation and joint activities presuppose a minimum of "shared knowledge"[1] which it is accordingly necessary to help to instil by means of a precise formulation of the remits of the actors. Adaptation to the legal context affecting the responsibilities of elected representatives is also necessary to promote innovation and creativity.

The conflict between the knowledge of specialists and the knowledge and beliefs of local actors

The position that the local actors and users have to (re)assume in the process of integrated management may result in a reversal of positions and of the relationship between the different types of knowledge. Local specialists who give opinions about the management of resources may feel themselves being called into question during debates and may feel that their scientific legitimacy is being challenged. The legitimacy of specialists depends less on their mastery of their sphere of knowledge than on the social recognition which they will succeed in acquiring during the process of negotiation and of integrated management.

1. Friedberg E. (1993)

Involvement of the various participants prior to the action, from the phase of conception, study and assessment

Integrated management can only be conceived within a collective context. In aiming for co-operative management, concertation and negotiation must be placed at the centre of the programme from its initial conception. Semi-directive interviews, questionnaires, requests for advice or straightforward discussions can admittedly establish an initial level of participation among local actors (general public, institutions, associations etc.), but they only result in their superficial involvement. In a way, the actors are perceived as objects of study and not as genuine participants in conceiving, implementing and evaluation of activities.

Contexts which do not lend themselves to integrated management as set out in the general approach discussed above

This relates to sites where the issue of conservation is extremely important in the very short term. When local actors are not already involved then swift, unilateral action by a State or public body will sometimes be the only way in which such issues can be addressed...

Fishing is a very common activity in Mediterranean wetlands

Tour du Valat

This action will be resorted to in accordance with the safety-first principle and subsequently, in the wake of these initial protective measures, it may become integrated into a more wide-reaching and long-term process of integrated management.

The project organisers frequently report the presence of pre-existing tensions that are very persistent and over which attempts at concertation may stumble[1]

This is particularly likely to be the case with protected areas, nature reserves or National Parks, where conflicts between the local communities and the State at the time of their creation remain firmly fixed in peoples' memories and endure despite the desire for change for these protected areas. Among this type of constraint could also be included the difficulties associated with rivalries and conflicts between local elected representatives from the different communities affected (concerning their territories and/or their remits). They may constitute serious constraints on the establishment of an active partnership that can stimulate the development of integrated management.

When all is said and done, in order to develop, establish its social, territorial and institutional basis and succeed in its objectives, the process of integrated management must aim to achieve rapid, practical results together with the definition of a shared vision for long-term development. This entails four factors in particular which should not be lost from view in this approach:

- A system of responsive management, of learning from experience, based on research and local knowledge.

- Close association between, on the one hand, swift and visible results and on the other, sufficiently precise long-term planning.

- Programmes of training and information for the management of natural resources for leaders, local authorities, managers and administrative staff.

- A close relationship with local, regional and national public authorities to ensure effective management.

1. Fleury P., Larerre R., Dorioz J.-M., Guiseppelli E., Jullian C., Birck C. (2003)

... but also some opportunities to be taken

In view of these constraints, which are very real and which mean that integrated management presents a serious challenge for the actors who wish to become involved in it, four opportunities are listed which can pave the way for this process:

- The development of concepts related to the management of sites and of natural resources. There has been a convergence of ideas, to the benefit of sustainable development and environmental/societal/economic integration.

- The development of institutional systems, favouring decentralisation, opens up favourable prospects for the increased involvement of the communities affected by the exploitation and management of wetlands. In most countries, examples are coming to light of processes of concertation and negotiation between State, local communities and civil society for the preservation of the natural heritage.

- International conventions, to which most of the Mediterranean countries are committed, widely promote the implementation of systems and measures for integrated management and provide support at the legislative level.

- The recent extreme weather events have had the effect of bringing home to decision-makers in a forceful way the fact that the development of land still needs to take serious account of the biological and hydrological functioning of Mediterranean wetlands.

Conclusion

An increasing number of actors and decision-makers in the Mediterranean basin are taking up or considering strategies of integrated management. Various existing approaches and tools may play a useful part. However the putting into practice of approaches based on concertation and mediation between users, the genuine decentralisation of the management of natural resources to the local level, are far from being easy tasks. Exchanges and dissemination of the results of the experiments that are beginning to emerge must take place, to give greater strength and consistency to programmes for the integrated management of this exceptional natural heritage of Mediterranean wetlands.

Mediterranean wetlands are fragile, diverse, multifunctional places that fulfil essential functions in the social and cultural as well as the hydrological, biological and economic spheres. Such diversity fully justifies the interest being shown in these places which, although they only amount to a small area, are counted among the most productive from the point of view of biomass and biodiversity. They play a

Wetland in Morocco

Eel fishing in the Camargue

crucial role in the migrations of many species of birds and fish. This natural wealth is faced with a variety of threats. Drainage and agricultural improvement have considerably reduced the area of Mediterranean wetland over the course of the last century. Pollution, urbanisation and overexploitation by fishing and hunting, cast doubt on the future of the remaining wetlands.

In the Mediterranean, the protection of wetlands is affected by a heterogeneous range of social, economic, legal and institutional contexts that make it difficult to generalise about methods and approaches. The problems differ significantly, in particular on several levels between the north and south sides of the Mediterranean. The urgency of demand for water, the strength of population trends and the very nature of the institutional systems by which activities to promote the more sustainable management of these places may be undertaken, manifest themselves in very different ways. But on either side, the obstacles in the way of a more sustainable management of wetlands arise in the technical sphere as well as the socio-political. The functioning of these ecosystems, which are subject to major seasonal variations and where fresh and salt water regimes are combined together, is clearly very complex. The influence of human activities and various types of pollution on their functioning is still not very well understood. This means that it is particularly difficult to develop rules for management that are appropriate and viable for every specific context. Furthermore, conflict between often incompatible uses within these highly coveted places leads to strained relations between the different user groups. This presents an additional constraint that impedes the process of producing multi-use management strategies to create agreement on the ground.

Conclusion

An examination of various attempts at protecting Mediterranean wetlands enables a number of lessons to be drawn out that support the case for a more integrated form of management. Management and decision-making processes that apply to these areas often appear to be fragmented, insufficient account being taken of their social and economic history. Environmental research is only weakly connected with decision-making by institutions that are not appropriate for sustainable development and that are far too focussed on the short term. In general, the lessons of experience show that communities are too remote from the conservation process.

Through the Ramsar Convention, ratified in 1971, wetlands are the subject of a specific convention which recognises their importance and defines the strategic elements of their conservation. The most recent major international summits have emphasised the concern for sustainable development, a concept which is fully applicable to these areas, where human activity is very significant and on which human communities depend for a large proportion of their income, if not for their survival. Concepts relating to nature conservation have undergone a remarkable evolution, from the first preservationist days to integrated conservation. This conceptual debate, based on experiences with protected areas, has given birth to a concern to integrate the social, economic and environmental aspects of development more effectively into measures for the protection of natural resources. The issue today is to raise the problem of conservation in the framework of a wider approach to planning and land development that involves local populations.

The areas addressed in studies of integration are wide-ranging, in accordance with the large number of authors, and show that the concept of integrated management is not subject to a truly unanimously-agreed definition. There are three overlapping areas of concern: socio-economic, political and technical. What is entailed first of all is the integration of the social and the economic into conservation, man and society being at the heart of the process of sustainable management. Subsequently the integration of politics is desirable, so that the conflict between environment, planning and economic development, so detrimental to conservation, can be moderated. Finally, integration of the processes and functioning of the ecosystems to be protected is required.

Over the last twenty years or so, a range of initiatives, inspired by the concept of integrated management, have been concerned with new modes of protection for Mediterranean wetlands. The approaches promoted by these experiments enable a certain number of reference points to be established that are of use to the actors who, in their own particular situations, wish to promote the integrated management

of wetlands and to work towards the elaboration of an appropriate strategy.

These approaches support the establishment of a process of governance that is centred on conserving and making sustainable use of these wetlands. They facilitate the initiation of a process of negotiation and the development of a shared medium-term territorial project by the various local actors and representatives of the users involved. This project strives for an improved interlinking of social, ecological and economic concerns through the involvement of communities. It is therefore a question of giving sustained support to an iterative process that combines medium-term planning with short-term practical activities.

The approaches put in place are also favourable to the extent that they enable management bodies to be set up that become progressively legitimised and recognised at different levels: local, regional, national and international.

In the most successful experiments, the State agrees to transfer the mandate for the management of wetlands to institutions which

Fishing fleet
on a Mediterranean lagoon

Tour du Valat

include the elected representatives of communities, but also representatives of social and occupational groups and of associations derived from society in general.

The success of a process of integrated management would appear to be strongly associated with certain conditions which it is useful to reiterate here:

- Integration of the participation of the public and of communities from the beginning of the process,
- Making the most of funding opportunities for the support of the process, especially in the early stages,
- The creation or improvement of documentation and regulations which are consistent with the proposals being supported in the framework of the integrated management process,
- Integration of water resource management,
- Appropriateness of the existing institutional system.

In fact, these experiences highlight the constraints to be overcome, especially regarding decentralisation of the management of natural resources and the role of the State in supporting the process.
It can therefore be seen that the implementation of an integrated management initiative is no easy matter. It is particularly demanding for the leaders who are trying to promote this type of approach. They have to succeed in uniting the wide range of actors involved around the objective of sustainable wetland management. For this they must acquire abilities for mediation and must encourage the growth of a core of actors representing the various interests at stake. States, for their part, in addition to the commitments that they have made through international conventions, should also play a more active role in encouraging the processes of local concertation and should give them sustained support.

The wide range of experiences which this work has been able to examine also demonstrates the importance of encouraging exchanges of experiences among those who are trying to promote the integrated management of Mediterranean wetlands. Such exchanges facilitate an improved dissemination of experience among the various countries, giving more power and more consistency to programmes for the integrated management of this exceptional heritage of Mediterranean wetlands.

Bibliography

Agences de l'Eau, Ministère de l'Ecologie et du Développement Durable - Les zones humides et la ressource en eau. Guide technique. Etude sur l'eau, n° 89, 2000.

Allali-Puz H., Béchaux E., Jenkins C. Gouvernance et démocratie locale dans les parcs naturels régionaux de France. Fédération des Parcs Naturels Régionaux de France, mai 2003, 13 p.

Amouretti M-C. *et al.* - Campagnes méditerranéennes : permanences et mutations, UER d'Histoire, Université de Provence Aix-Marseille, 1977, 317 p.

Baissette G. - L'étang de l'or. Les presses du Languedoc, 1990, 242 p.

Banner G. - Etat et collectivités locales, la "gouvernance communautaire" au cœur du processus de décentralisation. Problèmes économiques, n° 2 783, décembre 2002, p. 14-21.

Barouch G. - La décision en miettes, systèmes de pensée et d'action à l'œuvre dans la gestion des milieux naturels. Logiques sociales, L'Harmattan, 1987, 237 p.

Banuri T. Quel espoir pour les pays du Sud ? in Terre patrimoine commun (sous la direction de Barrère M.), éd. La Découverte, 1992, p. 163-170.

Bâtisse M. - Eau et développement durable dans le bassin méditerranéen. Plan Bleu. Document de travail, 2000.

Benessaiah N., (sous la direction de) - Aspects socio-économiques des zones humides méditerranéennes, MedWet, 1998, 167 p.

Béthemont J. - Les deltas méditerranéens : éléments pour une politique de l'espace, 1988, in Les deltas méditerranéens, Béthemont J. et Villain-Gandossi (éd.), Centre Européen de Coordination, de Recherche et de Documentation en Sciences Sociales (CEUCORS), Vienne, 1988, p. 15-58.

Beuret J.-E. - Petits arrangements entre acteurs... Les voies d'une gestion concertée de l'espace rural. NSS, 1999, vol. 7, n° 1, p. 21-30.

Beuret J.-E., Trehet C. – Pour la gestion de l'espace rural, appuyer les médiations territoriales, ENSA Rennes, département d'économie rurale et gestion, laboratoire de développement rural, 2000, 17 p. *nd.*

Bonnet B., Medimegh A. - Evaluation de l'approche participative dans le cadre du développement local, République tunisienne ; Ministère de l'Agriculture, de l'Environnement et des Ressources Hydrauliques, FAO/BIRD, juin 2003, 68 p.

Bousquet F, Barreteau O., Le Page C., Mullon C., Weber J. - An Environmental Modelling Approach. The Use of Multi-agent Simulations. In Blasco F. and Weill A. ed. Advances in

Environmental and Ecological Modelling, Elsevier, 1999, p. 113-122.

Brooks D. B. - Environnement, société et économie : les parties d'un ensemble, in Biodiversité, Equité et Environnement, CRDI, 1998, 50 p.

Brundtland G. H. - Our Common Future, Commission des Nations Unies sur l'Environnement et le Développement, Oxford University Press, 1987.

Calame P., Talmant A. - L'Etat au cœur, Le meccano de la gouvernance, éd. Desclée de Brouwer, Paris, 1997.

Charles L., Kalaora B. - La nature administrée, in Le Débat, n° 116, Gallimard, Paris, 2001.

Cicin-Sain Biliana, Knecht R. W. - Integrated Coastal and Ocean Managment, Concepts and Practice, Island Press, Washington, 1998.

Convention de Ramsar - La Convention sur les zones humides. Résolution VIII.4 – La gestion intégrée des zones côtières, principes et lignes directrices pour inscrire les questions relatives aux zones humides dans la gestion intégrée des zones côtières, nov. 2002, 33 p.

Davies G. - Aires protégées et coopération au développement dans les pays tropicaux, in Conservation de la nature et développement. L'intégration impossible ?, Gret-Karthala, Paris, 2004, p. 65-78.

Denis J., Henocque Y. - UNESCO, IFREMER, COI, MAB - Des outils et des hommes pour une gestion intégrée des zones côtières. Guide méthodologique, volume II, 2001, 64 p.

Desfossez P., Vanderbecken A. - Manuel de l'agent de terrain des espaces naturels, Atelier Technique des Espaces Naturels, Montpellier, 1997, 189 p.

ENSAR, Laboratoire SPDR - Fiche introductive : pour l'aide à la concertation en milieu rural : la médiation territoriale, Rennes, *nd.*, 2 p.

Fanchette S. - Le delta du Nil, densités de population et urbanisation des campagnes, URBAMA, ORSTOM, Fascicule de Recherches n° 32, Tours, 1997, 389 p.

FAO - Développement rural participatif, durabilité et environnement. Division des ressources humaines, des institutions et de la réforme, 1995, p. 38-40.

Faucher D. - Plaines et Bassins du Rhône moyen, entre Dauphiné et Provence, Armand Colin, Paris, 1927, p. 24, 670 p

Faure G. O., Mermet L., Touzard H., Dupont C. - La négociation : situations, problématique, applications, éd. Dunod, p. 148, 207 p., 2000

Fédération des parcs naturels régionaux de France - Ces collectivités qui font les parcs. Protéger la nature, une chance pour le développement. Octobre 2003, 15 p.

Fédération des parcs naturels régionaux de France - Le mode de gouvernance des parcs naturels régionaux pris en compte au Congrès mondial des Parcs de Durban. Les communiqués de presse, septembre 2003, 1 p.

Fédération des parcs naturels régionaux de France - Protection de la nature gestion des espaces naturels agricoles et forestiers. Les communiqués de presse, octobre 2003, 1 p.

Fédération des parcs naturels régionaux de France - Les Parcs naturels régionaux, exemple français du développement durable, seront au sommet de Johannesburg. Les communiqués de presse, Octobre 2003, 3 p.

Fédération des parcs Naturels Régionaux de France - La gouvernance dans un parc naturel régional français. La cas du Livradois-Forez – un pacte social pour conserver la nature, 12 p., *nd.*

Fleury P., Larerre R., Dorioz Jq. M., Guiseppelli E., Jullian C., Birck C. - Gestion concertée de la biodiversité, agriculture et développement local en montagne, Montagnes méditerranéennes, n° 18, décembre 2003, p. 65-74.

Friedberg E. - Le pouvoir et la règle. Dynamique de l'action organisée, Le Seuil, Paris, 1993.

Gayte X., Mounet J-P., Perrin C., Rocheblave M. - La gestion concertée des sports de nature en espace protégé, in La gestion concertée dans les espaces naturels de montagne, Montagne méditerranéennes, n° 18, décembre 2003.

Global Chance – Solagral - Le climat : risque et enjeu politique. De la conférence de Kyoto à celle de Buenos Aires, Courrier de la Planète, mars-avril 1998, p. 58.

Guéneau S., Chetaille A. - Régulation des échanges et protection environnementale : quels équilibres et quelles articulations entre biosécurité, accords multilatéraux sur l'environnement et Organisation mondiale du commerce ?, Solagral, actes de la journée de débat, octobre 1999, 112 p.

Gorgeu Y., Clément F. - La charte de territoire, dossier pédagogique, mai 1999, 16 p. + annexes.

Gorgeu Y., Jenkins C., Gentil A. - Pratiques de gestion de l'espace. L'expérience du Livradois-Forez. Eléments méthodologiques. in La Charte de territoire, une démarche pour un projet de développement durable. La documentation française - Mairie Conseils - Fédération des Parcs Naturels Régionaux de France, 1998, 307 p.

Gorgeu Y. – Pratiques de gestion de l'espace, l'expérience du Livradois-Forez, éléments méthodologiques, Mairie Conseils - Fédération des Parcs Naturels Régionaux de France - Parc Naturel du Livradois-Forez, 2is, *nd.*, 54 p.

Gorgeu Y. - Cinq principes pour un projet de territoire de qualité, Mairie Conseils, 1999.

Bibliography

Hecker N, Tomas Vives P. - Statut des inventaires des zones humides dans la région méditerranéenne, BIROE/ICN, IWRB publication, n° 38, 1995, 146 p.

Houée P. - Le Mené, la longue marche du développement : facteurs et fragilités d'un dynamisme, 1991- Les politiques de développement rural, 1989 – Démarches de développement local en milieu rural : l'expérience du Mené (1965-1986), 1987.

IIED - Whose Eden ? An overview of community approaches to wildlife management, Londres, 1994.

IUCN, PNUE et WWF - Stratégie mondiale de la conservation. La conservation des ressources vivantes au service du développement durable, Gland, Suisse, 1980.

IUCN - Guidelines for protected area management categories, Gland, Suisse, 1994.

IUCN, United Nations List of Protected Areas, UICN/WCPA/UNEP/UNEP-WC. Compiled by Stuart Chape *et al.*, 2003.

Institut français de la biodiversité - Des espaces protégés pour concilier conservation de la biodiversité et développement durable, fondements et recommandation d'une stratégie de coopération pour la gestion des espaces protégés. Les Cahiers de l'IFB, 2001, 52 p.

Kalaora B. - Au-delà de la nature, l'environnement. L'observation sociale de l'environnement. L'Harmattan, Paris, 1998, 199 p.

Kalaora B., Charles L. - Intervention sociologique et développement durable, le cas de la gestion intégrée des zones côtières. NSS, 2000, vol. 8, n° 2, p. 31-38, Editions scientifiques et médicales Elsevier SAS, 2000.

Kalaora B. - La concertation, outil ou art de vivre ensemble ? in La Gestion concertée dans les espaces naturels protégés de montagne, Montagnes méditerranéennes, n° 18, décembre 2003.

Lang P. - Le développement durable – Dynamique et Constitution d'un projet, préface à l'ouvrage d'Edwin Zaccaï, Presse Universitaire Européenne, Bruxelles, 2002, p. 13.

Lazarev G. - Vers un éco-développement participatif, Paris, L'Harmattan/PNUD/FENU, 1993.

Lebret J. (cité par Théodore Monod) - Et si l'aventure humaine devait échouer, Livre de poche, Paris, 2000.

Lee T., Middleton J., Phillips A. - Guidelines for Management Planning of Protected Areas, Best Practice Protected Area Guidelines Series n° 10, World Commission on Protected Areas, UICN, Cardif University, 2003, 79 p.

Lovelock J. - L'énergie nucléaire est la seule solution écologique, Le Monde, 1er juin 2004.

Lozach J. - Le delta du Nil, étude de géographie humaine. Le Caire, Mémoires de la Société royale de Géographie d'Egypte, 1935, p. 169, 303 p.

Lutz, M., Mondain-Monval, J.-Y. - Conventions internationales Ramsar et Aewa, deux exemples pour la conservation des zones humides et des oiseaux migrateurs, in Zones humides, les découvertes du programme de recherche, Espaces naturels, avril 2003, p. 32-33.

Maitland, P.S., Crivelli A.J. - Conservation des poissons d'eau douce. Conservation des zones humides méditerranéennes, Medwet, Tour du Vatat, Arles, 1996, 94 p.

Maltby, E. R. H., Newbold C. - The Dynamics and Functions of Coastal Wetlands of the Mediterranean Type. Final typescript report to DG XI, 1988.

Margat J. - L'eau dans le Bassin méditerranéen. Les fascicules du Plan Bleu, n° 6, Paris Economica, 1992, 196 p.

Margerum R., Born S. - Integrated Environmental Management : moving from theory to practice, in Journal of Environmental Planning and Management, volume 38, n° 3, 1995, p. 371-392.

Marsh G. P., Man and Nature, 1964 (édition de 1965), The Earth as Modified by Human Action, Belknap Press of Harvard University Press, Cambridge.

Martino, P., Portillo, A., Odriozola J. - Comparative analysis of the problem affecting conservation and management, in Morillo C., Gonzalez J.L. (eds), Management of Mediterranéean Wetlands, 2002.

Mathevet R., Mauchamp A., Lifran R., Poulin B., Lefebvre G. - Interactions territoriales, dynamiques des usages et de la biodiversité dans les zones humides du delta du Rhône : une approche par la modélisation multi-agents. Bulletin de l'Association des Géographes français, 80 (4), 2003, p. 417-429.

Mathevet R., Mouret J.-C., Mesléard F. - Du mondial au local : originalité et dépendances de la riziculture camarguaise. Dossier, Faire Savoirs n° 2, octobre 2002, p. 49-56.

Mengin J. - Guide du développement local et du développement social, coll. Logiques sociales, L'Harmattan, Paris, 1989, 164 p.

Mermet L. - Stratégies pour la gestion de l'environnement, coll. Environnement, L'Harmattan, Paris, 1992, 201 p.

METAP-PAM - Evaluation d'initiatives de gestion intégrée des régions littorales méditerranéennes, expériences du METAP et du PAM, 1988-1996, 63 p. + annexes 2000.

Navarro C. - Analyse des structures de gestion, outils de la gouvernance environnementale, cas d'étude des étangs de l'Or, Palavasiens, Canet Saint-Nazaire, rapport de synthèse, 2004, 38 p.

ODESYPANO-GTZ - L'approche participative et intégrée, (document fondateur de l'AP produit par cet Office qui fait référence en Tunisie dans ce domaine), 1996.

Ollagnon H. - Une approche patrimoniale de la qualité du milieu naturel, in Mathieu N. et Jollivet M. (dir.), Du rural à

l'environnement. La question de la nature aujourd'hui, ARF-L'Harmattan, Paris, 1989, p. 258-268.

Ornat A. L., Correas E. - Gestion des aires protégées méditerranéennes, évaluation et opportunités des réseaux et plans d'action, UICN, Centre for Mediterranean cooperation, 2003

Pergantis P. C. - Study on the Integrated Managment of Coastal Wetlands in Western Greece. Final typescript report to DG XI, 1988, 92 p.

Peyrefitte M. - Politiques publiques – outils et implications économiques. L'évaluation du mode de gouvernance territoriale, séminaire Politiques publiques : outils et implications économiques, décentralisation, libéralisation et nouvelles formes de gouvernance, septembre 2000, 13 p.

Potvin C. - La biodiversité pour biologiste : "protéger" ou "conserver" la nature ?, in La biodiversité. Tout conserver ou tout exploiter ?, Parizeau (ed). Paris-Bruxelles, De Boeck Université, p. 36-46, 1997.

Ramsar - The list of Wetlands of International Importance, octobre 2003, 33 p.

Ramsar - La Convention sur les zones humides, Lignes directrices pour la mise en œuvre... De la participation des communautés locales et des populations autochtones, "L'homme et les zones humides : un lien vital". 7e session de la Conférence des Parties contractantes à la Convention sur les zones humides (Ramsar, Iran, 1971) San José, Costa Rica, 10-18 mai 1999.

Ramsar - Processus participatifs en vue d'associer les communautés locales et les populations autochtones à la gestion des zones humides, Ramsar - COP7, mai 1999.

Réserves Naturelles de France - Plans de gestion des réserves naturelles – Méthodologie, Atelier technique des Espaces naturels, Montpellier, 1998, 96 p. + 4.

Rey-Valette H., Cormier-Salem M. C., Point P., Antona M. - Participation des sciences sociales à la réflexion prospective, Introduction, PNEC, 2004-2008, 11 p.

Rey-Valette H. - La composante sciences sociales, revue des questions et des travaux relatifs aux lagunes méditerranéennes, 2001, 10 p.

Rodary E., Castellanet C., Rossi G. - Conservation de la nature et développement. L'intégration impossible ?, coll. Economie et Développement, Gret-Karthala, Paris, 2004, 310 p.

Roqueplo P. - Entre la science et la décision, le "trou noir" de l'expertise, in Le Monde Diplomatique, Savoirs, août 1992, p. 98-99.

Sachs I. - Environnement, développement, marché : pour une économie anthropologique, Nature, Sciences, Sociétés, 2, 3, p. 258-265, 1994.

Sachs I. - Une chance à saisir, in Johannesburg, Sommet mondial du Développement durable, 2002. Quels enjeux ? Quelles contributions des scientifiques, Ministère des Affaires étrangères-ADPF.

Sainte-Marie (de) C. - Modernisation de l'agriculture et reproduction des inégalités de développement en Egypte, in Cannon B., édit, Territoires et sociétés au Maghreb et au Moyen Orient, Etudes sur le Monde Arabe, n° 2, Maison de l'Orient, Lyon (diffusion Sindbab, Paris), p. 247-269.

Salenave M., Roudier C., Gamet R., Laurent A. - Gestion en bien commun des milieux aquatiques, essai de mise en œuvre en Languedoc-Roussillon, BSLG, janvier-juin 1993, fasc. 1-2, 298 p.

Salles J. M. - Développement durable, les limites de l'économie de l'environnement, Courrier de la Planète, n° 40, juin 1997, p. 30-32.

Seca - Charte intercommunale d'environnement de la Camargue gardoise, Méthodologie, 1993, 40 p.

Shipman B. - Facteurs dans les partenariats réussis en milieu côtier – l'expérience CoastLink, TERRA Conférence Programme, Naples 1998, in Améliorer la mise en œuvre des programmes de gestion des zones côtières, rapports et documents de l'atelier PAM/PAP/METAP, Malte, 17-19 janvier 2002, 263 p.

Skinner, J, Zalewski, S. - Fonctions et valeurs des zones humides méditerranéennes. Conservation des zones humides méditerranéennes, Medwet. Tour du Valat, Arles, 1995, 78 p.

Solagral - Convention sur la Biodiversité, Conférence des Parties n° V, mai 2000, Nairobi, Kenya, Ateliers d'information et de débats, Enjeux et débats autour de la biodiversité, document préparatoire aux ateliers, 16-18 mai 2000, 32 p.

Syndicat Mixte du Haut Béarn - Trois groupes pour se concerter, décider, agir, Charte de développement durable des vallées béarnaises et de protection de l'ours, 4 p. nd.

Syndicat Mixte de Gestion de l'Etang de l'Or. Note d'information, janvier 1997.

Syndicat Mixte de Gestion de l'Etang de l'Or - Etang de l'Or Infos, février 2001.

Teissier J. - Le programme européen LIFE "Grands Causses". L'expérimentation d'une gestion concertée de l'espace, BSLG, janvier-juin 2003. Fascicule 1-2, 298 p.

Tucker G.M. Health M. F. - Birds in Europe – Their Conservation Status. Birdlife Conservation Series n° 3, Cambridge, UK, 1994.

Turnbull C. - Les Iks. Survivre par la cruauté. Nord Ouganda, coll. Terre Humaine, Plon, Paris, (1972), 1987.

Viñals M. J. - El Patrimonio Cultural de los Humedales, Ministerio de Medio Ambiante, (Coordinacion), 2002, 263 p.

Bibliography

Watson T. R. - L'heure des surprises climatiques, in Changements climatiques, les politiques dans la tourmente. Courrier de la Planète, Global Chance, n° 61, 2001.

WB/EIB - Environmental Programme for the Mediterranée. Natural resources Management, Workin Paper n° 2. WB/EIB, in Guidelines for Integrated Management of Coastal and Marine Areas, UNEP Regional Seas Reports and Studies, n° 161, 1995, 80 p.

Weber J. - Conservation, développement et coordination : peut-on gérer biologiquement le social ? Communication au colloque de Hararé, 1996.

Wolf A., Post R. - An Integrated Management Approach, Europarc Expertise Exchange, Technical support for Central and Eastern European Protected Areas, Phare, 7-16 september, 1998, Hiimaa Centre, Estonia, 36 p.

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Station biologique de la Tour du Valat

Founded in 1954 by Luc Hoffmann, the Station biologique de la Tour du Valat is a private organization, managed by the Fondation Sansouire, whose work is recognized to be in the public interest. A team of approximately 60 people devotes itself to scientific activities, the management of the estate, and conservation actions.

An effective nature conservation policy must be based on scientific knowledge obtained from rigorous research. With this necessity in mind, the Station biologique de la Tour du Valat has set up a research program on the functioning of wetlands, and more particularly that of reedbeds, temporary marshes, and rice paddies. It is also involved in long-term studies of colonial waterbirds in the Camargue and Mediterranean region. The conservation department makes great efforts to promote the transfer of knowledge obtained by researchers and managers by developing management plans for the Mediterranean wetlands, setting up training sessions, informing and supporting policies promoting the rational management of these resources, and publishing raising awarness tools. Within this context, the Station biologique de la Tour du Valat has given itself the mission ***"to halt and reverse the destruction and degradation of Mediterranean wetlands and their natural resources, and promote their wise use".***

The MedWetCoast project

The MedWetCoast project aims at conserving the biodiversity of global and regional importance in 6 countries/authority in the Mediterranean basin: Albania, Egypt, Lebanon, Morocco, Palestinian Authority and Tunisia. Technically supported by the Station biologique de la Tour du Valat, Conservatoire du Littoral and Atelier Technique des Espaces Naturels, it is financed by the national contributions of these countries involved as well as the Global Environment Facility (GEF) through the United Nations Development Programme (UNDP) and the French Global Environment Facility (FGEF).

Launched in 1999, the project consists of three components. At the local level, it aims at implementing sustainable and intersectoral management in 15 pilot sites (wetlands and coastal areas). At the national level, it calls for developing innovative legal frameworks for removing the causes of biodiversity degradation, reinforcing the institutions involved in the management of natural resources and promoting coordinating policies. Finally, at the regional level, it strives for strengthening capacities through training and technical assistance and developing and sharing experience through networking.

The 'Institut de Recherches et d'Applications des Méthodes de Développement' has been working in the field of international development since 1957. Its activities cover four interdisciplinary fields: government policies, local development, management of natural resources, microfinance and rural professional organizations.

Based in Paris and Montpellier, France, IRAM seeks to associate competencies, ethical behaviour and professional excellence. Its research activities concern every stage of the project cycle, from initial identification to final evaluation. IRAM is also involved in support and consultancy activities. Diverse long term development programs are carried out, in collaboration with national partners, and this forms the basis for the work on methodological aspects. In particular, IRAM backs the process of decentralization that is being engaged in several countries of the South, and tries to link it with local development effort. Its objective is to promote the integrated and sustainable management of spaces and natural resources by local stakeholders. It supports the setting up and strengthening of local organisations involved in the management of rural hydraulic installations, irrigation systems, and drinking water supply. At the national and regional level, IRAM participates in the development of government policies aiming at sustainable development.

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