

INTERNATIONAL ASSOCIATION FOR MEDITERRANEAN FORESTS



***THE PROBLEM
OF THE MEDITERRANEAN FOREST***



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OF THE MEDITERRANEAN FOREST*

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PREFACE

I am proud and happy to present this volume, the result of a largely collective effort.

As the reader will gradually discover in reading these pages, "Mediterranean woodlands constitute something far too complex to be left in the hands of foresters alone" ; or, indeed, in the hands of any other single professional or activist group.

A forestry engineer myself, I belong to a generation that has seen society changed by tremendous upheaval : decolonisation, exodus of the rural population from the land, urbanisation, improvement in schooling, the arrival of women in the work place, in politics and in NGOs, an increase in life expectancy, and so many other changes whose impact has varied depending on whether one is in the "north" or in the "south".

Mediterranean societies have not waited for the turn of the millennium to undergo a mutation and, hand in hand with it, their institutions have changed and developed.

First and foremost : in relation to such changes, it is important that each person involved in whatever way with natural land areas and woodlands around the Mediterranean should not find him- or herself born along as in a whirlwind by these changes : we must try to understand what is taking place or otherwise we shall end up with nothing to propose by way of understanding the position occupied by Mediterranean woodlands in the life and perspective of our present-day regions.

Without such understanding, how can new ways of management emerge that will be better suited to the development of local societies, of their riches and diversity, to the wise management of natural resources and to satisfying the needs of the greatest number of our fellow contemporaries and – above all – of those who will inherit our world ?

Here, then, is the reason that so many colleagues, members of the International Association for Mediterranean Forests, or simply friends and sympathisers, have joined together over the last two years to lay the basis for what they collectively propose : **an approach for tackling the issue of Mediterranean woodlands that is not exclusively silvicultural, nor just environmentalist, nor only administrative or organisational, nor limited to history, to sociology or to ethnology, nor productivist, nor nostalgic ; but an approach that attempts to penetrate from the inside the life and development of the regions or the vital space of the actual inhabitants, producers, users and other people involved.**

Nowadays, every discipline boasts top class specialists working together through effective networking. We must do no less than help ensure that their work gets widely known by other relevant networks.

Some readers may be surprised or disappointed not to find in these pages new data related to one specialisation or another. But such has not been our aim in this undertaking. On the other hand, we submit here multiple and complementary insights on that single object which unites our efforts : Mediterranean woodlands.

From this starting point, I hope we can count on you to explore together with us topics that may indeed become more detailed and technical, closer to the cutting edge, but which we will come to see and understand better, both in their territorial context and in the contemporary era.

Mohamed Larbi Chakroun
President of the International Association
for Mediterranean Forests

INTRODUCTION

The Interreg IIC programme "Western Mediterranean-Latin Alps", an initiative of the European Community, concerns regions around the Mediterranean coast from Gibraltar to the Tyrrhenian Sea, in Spain, France and Italy, as well as certain inland regions where Mediterranean factors impinge : Aragon, Rhône-Alps, Piedmont and Lombardy.

The programme's aim is to give effect to the EC Area Development Scheme and, more generally, to instigate new orientations in the EC's way of operating. This programme comprises four sub-programmes :

- General action involving the Mediterranean Rim
- Transport and communications systems
- Urban planning and metropolitan growth
- Making the most out of natural and cultural heritage and sustainable development.

In so far as the project "The Problem of the Mediterranean Forest" centres on land use and sustainable development, it seemed advisable that it should be subsumed under the heading "General action involving the Mediterranean Rim". Indeed, as we shall see further on, Mediterranean woodlands are one of the key features that "configure the Mediterranean". Though variations may occur, the region is stamped by the specific nature of such woodland environments, of the populations that live in and from them, and of their history and management.

Moreover, Mediterranean woodlands can in no way be minimised to some 60 to 80 million hectares of worthwhile heritage in need of preservation and promotion as an entity under threat from socio-economic life : these woodlands possess a living, dynamic aspect that changes unceasingly, involving rural but also peri-urban and urban areas. Not only are they a reservoir of economic activity – ranging from the most traditional, such as silviculture, grazing or hunting, to the most contemporary, such as tourism or the new nature-oriented pursuits ; they also boast prodigious biodiversity, forming a school for ecology and furnishing the most meaningful signs and tools that determine regional organisation.

Thus, it has proved most fruitful that the European Community should have allowed Campania and Provence-Alpes-Côte d'Azur, the two Regions that instigated the project "The Problem of the Mediterranean Forest" with the backing of their respective countries of Italy and France, to recruit other parties : in the first place, the Valencia Region in Spain, which has made a noteworthy contribution to the project ; but also other

involved parties from numerous specific Regions affected by the "Western Mediterranean-Latin Alps" programme, along with people from all Mediterranean horizons, particularly in North Africa.

We would like to acknowledge the contribution of all our partners in this effort, those who funded it as well as those who took an active part. May they accept with special thanks this publication which should provide them with an account they are entitled to expect.

MEDITERRANEAN FORESTS, NATURAL LAND AREAS

We have opted for an etymological definition of the word forest : that is to say, an area not necessarily wooded to some minimum degree but, rather, the outermost parts of a given territory : "forest = outside, exterior" – thus, the French *forain*, the English *foreigner*, the Italian *forestiere*.

An agreed definition has been a recurrent topic, but all taking part in the project "The Problem of the Mediterranean Forest" have had to recognise that this etymological basis was no doubt the most acceptable. Even so, in order to avoid continuous reappraisal, it has seemed wise in the early stages to specify "Mediterranean forests and natural land areas" or "Mediterranean woodlands and natural areas".

Without rehashing the terms of a debate that rears its head throughout the following pages, it has to be acknowledged that subjects are included that have little of forest about them : the fixing of dunes near the Sahara or along coasts, the protection and restoration of soils, or the management of steppe-like zones, such as the Ufa area, grassland and bush.

That such zones, depending on the region, commonly figure de facto in the debate really confirms only that what is accepted as "Mediterranean woodland" comprises those areas which a society basically considers the least importance in its overall economy.

This does not, of course, mean that at some particular time of the year woodcutters, shepherds or other players in the local economy or some other user such as hunter, hiker or aesthete, might not utilise such areas intensively or significantly, thereby affecting the dynamics of their ecology or their appearance (clear cutting, replanting, land clearance for farming or grazing, firebreaks...).

So the project "The Problem of the Mediterranean Forest" must be seen as encompassing all those areas, be they in a rural, peri-urban or urban setting, whether wooded or not, whose management is conditioned above all by the natural influences that remain the dominant feature in their dynamics.

THE REAL POSITION OF MEDITERRANEAN WOODLANDS IN THEIR REGIONS

The genesis of this project derived directly from the ideas that gave rise to the founding of the International Association for Mediterranean Forests and, at the same time, fuelled an awareness of the need for a *First Mediterranean Conference on Forests and Natural Land Areas*.

On November 21, 1997, at Marseille, a first workshop seminar organised by the International Association for Mediterranean Forests formally noted that :

- at a worldwide level, the question of Mediterranean forests and natural land areas is almost totally overlooked by forestry professionals (Paris Congress in 1991, Antalya Congress in 1997) and environmentalists (Rio Conference in 1992), whereas heightened attention is paid to tropical rainforests (Amazon, Indonesia) and those in dry zones (sub-Saharan Africa) as well as to northern forests (Canada, Russia)...
- a gap persists between those, broadly referred to as silviculturalists, whose preoccupation is economic production and those, broadly termed environmentalists, who highlight environmental issues. This gap would indeed appear to be growing.
- though marginal rural areas and natural and woodland areas generally play an ever-diminishing role in national and regional economies, and whereas local populations no longer possess an intimate understanding of them¹, such areas are the focus of an increasing number of institutional bodies : local government authorities, ministerial departments, assorted voluntary organisations...
- despite such trends, at every level of land use planning woodlands play a vital role : they form the framework of a region and, at the same time, provide a tissue of interconnections.

¹ This remark applies mainly to the rich northern Rim of the Mediterranean, less to the countries of the southern Rim ; but overall there is the same general tendency.

The International Association for Mediterranean Forests has as its aims :

- that the natural and woodland areas of the Mediterranean be given consideration in whatever their geographic situation, whether in a less or in a more developed country, whether near towns or in isolated valleys,
- that they be considered in all their aspects :
 - ♦ social, whether the population involved lives in and from the woodland habitat or uses it as walkers or hikers,
 - ♦ aesthetic,
 - ♦ ecological, using forest to make lower zones downstream safer from flooding and other risks, while at the same time taking into account the outstanding diversity of the plant and animal species,
 - ♦ economic, for it must not be forgotten that woodlands produce considerable wealth, encompassing traditional harvesting of wood, cork, mushrooms, aromatic plants, resins, milk, meat, game... along with more subtle "amenity" benefits such as the simple pleasures of walking through the woods,
- that every institution, whether public and private, administrative, economic or voluntary, as well as every person involved in understanding, managing or protecting such woodlands, can exchange and explain their viewpoints.

Thus it became imperative to tackle these issues, confronting them together, soliciting every possible partner from all the countries around the Mediterranean Rim, with their multifarious skills and preoccupations ; finally, to submit them in the form of a question to the political and administrative decision-makers in the countries and regions involved : as the regions evolve, **what does the future hold for these woodlands and natural areas ?**

GETTING INTO GEAR

By way of response to this question, a debate took place resulting in a decision to prepare an international conference to cover the whole of the Mediterranean Rim. At this event, everyone concerned – elected members of local government, private landowners, environmental and silvicultural engineers and technicians, livestock rearers and timber producers, hunters, teachers, researchers, naturalists, naturelovers and activists from voluntary organisations, administrative officials from regional land use development and planning departments – indeed, anyone interested, to whatever degree, in Mediterranean woodlands and natural areas would be able to make clear what one and all have in common : this very interest itself.



Later on, in reference to the worldwide impact of the Earth Summit at Rio, it was felt that there was a need for a "trumpet blast" in favour of Mediterranean woodlands. As things stand, while woodlands are in evidence throughout the Mediterranean area, from the actual centres of great metropolises to the edges of the deserts and the high mountain reaches, such woodlands appear so diverse that they are never taken into account as an overall ensemble.

Beyond the specific traits of their ecology and a renowned biological diversity observable even to an ordinary walker, Mediterranean woodlands display an extraordinary variety linked to the differences in the organisation and development of various societies, territories and institutions. The present-day situation prevailing in such woodlands is totally related to their past, recent or far-off : today, we know that ever since the inception of a Mediterranean climate, man has always been present on the western outposts of the Euro-Afro-Asian land mass. And it is this very climate (a single hot, dry season, a single cold, damp season) that stamps the natural environment around the Mediterranean.

Thus, there is a paradox that we need to face head on : in highlighting the unity of Mediterranean woodlands, we must focus on the variations from one small area to another, variations between regions, between human and natural environments, so that in the heart of each region, in each locality, the unifying principle will not only get due recognition but will also obtain the means necessary for its understanding, protection and, above all, for its management. And this unity, let it be repeated, is so very basic and "obvious" that it gets overlooked.

There is, therefore, another new campaign to be launched : parallel to the – necessary – protective measures against wildfire, the forests need protection against indifference.

Consequently, with the end of 2001, two years of hard work have terminated as planned in the Interreg IIC programme, resulting in this present, highly collaborative publication.

Six work groups were set up under the chairmanship of six recognised authorities to undertake consideration of what the initial seminar in Marseille identified as being the major topics fundamental to defining a new approach to Mediterranean woodlands.

Carlo Bifulco, Director, Vesuvius National Park (Italy), convened a seminar at Naples (Italy) on the **Ecological Specificities of the Mediterranean Rim**.

At Torre del Greco (Italy), **Américo Carvalho Mendes**, Professor at the Portuguese Catholic University of Porto (Portugal), organised and led the collective work on **Societies, Territories, Institutions**,

a group explicitly put in charge of discussing, among other matters, economic questions.

Andrée Corvol-Dessert, Director of Research at the CNRS (National Scientific Research Council), (Paris, France) and chairperson of the *Groupe d'histoire des forêts françaises*, led a seminar at Aix-en-Provence (France) on **Culture and Heritage**.

At Marseille, **Michel Bariteau**, Director of the Unit for Research on Mediterranean Forests (Avignon, France), a part of INRA (National Institute for Agricultural Research), convened a work group at Avignon and a seminar at Marseille on the topic **Training, Research, Raising Public Awareness**.

Ricardo Velez-Muñoz, Head of the Wildfire Protection Service of the Spanish General Service for the Protection of Nature (Madrid, Spain), led a seminar on **Risks Threatening Mediterranean Forests and Natural Land Areas and the Role of Forests in Risk Prevention**.

Finally, the **Executive Secretariat** of the International Association for Mediterranean Forests brought together in Marseille the leaders of the five work groups along with several other key figures, to consider how to organise **Cooperation** on the subject of Mediterranean forests.

These preparatory efforts led to a concluding round-up seminar, hosted at Marseille on November 6, 2001 by the Government Council of the Provence-Alpes-Côte d'Azur Region. It is the synthesis of the accumulated hours and days of collective effort that are here presented to readers in the following pages.

Some guideline observations need to be given to the reader at the outset.

The work presented here has been conceived as the groundwork for the preparation of the *First Mediterranean Conference on Forests and Natural Land Areas*. This preoccupation makes itself felt throughout the book.

However, as will become clear further on, Mediterranean woodlands in the various countries around the Mediterranean Rim "are not what they used to be". Societies have changed and continue to do so ; the territory they occupy, also. The habits of the resident populations, though still showing great diversity, are evolving at an incredible rate whereas, at the same time, social representation and institutions have changed much more slowly.

And what should be said of the changes to the economy, and to local economies ? And, more specifically, to the economies in the countryside, in the djebels and in the woodlands ?

Here, then, without rushing headlong into a consideration of topics that are of prime importance and will, in due course and of necessity, be discussed, such as :

- a study of the state of habitats,
- dendrology,
- Mediterranean silviculture,
- techniques for combating erosion, wildfire and attacks from parasite,
- organising reception of the public,
- enhancing the value of woodlands to tourism,
- the protection of rare and valuable ecosystems,
- techniques for harvesting wood and other products,
- the use of IT and new techniques of analysis,
- wildlife management
- etc...

... here, then, we have insisted on characterising the main new approaches with which to confront **The Problem of the Mediterranean Forest**.

The text of the book is a synthesis written on the basis of :

- contributions that were written in advance and given at the seminars,
- contributions that were structured but were not written,
- the discussions and debate.

As with every synthesis, the text conveys the essential features of the ideas that emerged and of the ensuing exchanges, and it has been approved by those who took part. Thus, it is true to say that the present document accurately represents the whole of the projected undertaking and that **The Problem of the Mediterranean Forest** was indeed tackled as we had hoped.

It now lies with us, and with the reader, to make good this send-off so that Mediterranean woodlands will be better taken into account, not just by ourselves but in public policy and in land use and development.

Jean Bonnier
Executive secretary
of the International Association
for Mediterranean Forests



SYNTHESIS OF THE WORK UNDERTAKEN

For a rapid overview...

The following 27 pages (15-43) provide a synopsis :

- The Marseille Declaration on Mediterranean Forests adopted at the end of the Programme, 6th November 2001 (page 13).
- Synthesis of the Programme (page 15).
- Syntheses of the proceedings of the 6 group workshops :
 - ♦ Ecological Specificities of the Mediterranean Rim (page 19).
 - ♦ Civilisation and Heritage (page 23).
 - ♦ Societies, Territories, Institutions (page 25).
 - ♦ Risks Threatening Mediterranean Forests and Natural Land Areas and the Role of Woodlands in Risk Prevention (page 29).
 - ♦ Training, Research, Raising Public Awareness (page 33).
 - ♦ Cooperation (page 37).



MARSEILLE DECLARATION ON MEDITERRANEAN FORESTS

Participants at the seminar held in Marseille on November 6, 2001, whose purpose was to approve the conclusions of the project "The Problem of the Mediterranean Forest" – a project led by the International Association for Mediterranean Forests within the framework of the EU programme Interreg IIC Western Mediterranean-Latin Alps, in partnership with the French Government, the Regional Government Councils of Provence-Alpes-Côte d'Azur and Campania, the Vesuvius National Park, and with help from the Comunidad Valenciana – share the following strongly-held views :

- 1- Mediterranean woodlands and natural land areas (hereafter referred to as Mediterranean forests), a heritage from the past, provide the underlying basis on which local societies have organised their space. Fields, infrastructure for production and transport, residential and recreational areas, indeed everything that makes up man's collective existence, have evolved in a framework formed by these forests that are now managed by their private or public owners.
- 2- Such forests have specific features as well as an abundance of riches, ecological, forestry and socio-economic, that are insufficiently taken into account by those who, at a global and European level, do the deciding about how forests and natural areas should be.
- 3- Around the Mediterranean Rim, on the northern side as on the south, and even under widely different socio-economic conditions, it can be clearly observed that forestry professionals and environmentalists have difficulty in concerting their knowledge and skills.
- 4- At the same time, the general trend towards decentralisation now being felt in all countries has resulted in a multiplication of governmental centres of decision-making responsible for the regional planning and spending policies that affect Mediterranean forests. Yet there has been no requirement made for their concertation.
- 5- The threat thus exists that a poor understanding of the characteristics of Mediterranean forests, combined with the fragmented approach now prevailing, will hinder decision-makers from taking into account the specific features of Mediterranean forests.
- 6- It is desirable, and is being proposed here, that reflection, exchange and further work deriving from the Interreg IIC initiative be carried on :
 - ♦ by jointly comparing and assessing the various projects that, in one way or another, involve Mediterranean forests in order to improve land use management through enhanced awareness of the different possibilities,
 - ♦ by pursuing the network-based activities involved in the project "The Problem of the Mediterranean Forest",
 - ♦ by instituting cooperative activity via the framework of either the Interreg IIB, MEDOC or SUDOUEST projects, or through other European programmes (Archimed, Meda...),
 - ♦ by arranging for the *First Mediterranean Conference on Forests and Natural Land Areas* to be effectively held.
- 7- The groundwork for the *First Mediterranean Conference on Forests and Natural Land Areas*, largely carried out under the project "The Problem of the Mediterranean Forest", should provide a more than ample basis for convening the First Conference in 2003. A second conference in 2006, to be held at a different venue, would truly consolidate the effectiveness of the networks set up with the aim of getting greater consideration for Mediterranean forests in drafting sustainable land use and management policies.
- 8- The International Association for Mediterranean Forests represents a particularly effective means for maintaining the dynamic of such networks and for enabling international projects, which are by definition collaborative and interdisciplinary, to be effectively carried out.

THE PROJECT "THE PROBLEM OF THE MEDITERRANEAN FOREST"

(SYNTHESIS)

Denys POULET*

THE CHARACTERISTICS OF MEDITERRANEAN FORESTS AND NATURAL LAND AREAS

The Mediterranean climate is characterised by a marked lack of rainfall in summer and by winter temperatures too low to enable plants to take advantage of the precipitation that falls during this season. This climate produces severe constraints on the natural environment and makes the problem of wildfire very acute. The rainfall pattern favours erosion-related phenomena.

The Mediterranean region is a region inhabited by man. Human presence around the Mediterranean Rim from the very inception of a Mediterranean climate explains the emergence of numerous ecological niches – and, thus, of biodiversity – as well as a real diversity in the landscape. Over-exploitation of the natural environment occurs and can give rise to a dynamic of deterioration, indeed of erosion. The diversity and the wealth of natural woodland species around the Mediterranean are related to the different forms of management and use by the local populations ; but, also, to the integral role they have played in very old civilisations.

The pattern of land use typifying the Mediterranean region differs from that of regions with distinct areas given over, variously, to industrial or agricultural activity, to housing or just left in a natural state.

Mediterranean woodlands are characterised by specific functions and interests deriving from their given local socio-economic contexts and by the multiplicity of the people involved with them.

Mediterranean woodlands are multifunctional and, despite their low output of wood products, generate a

number of other products (non-ligneous...) and non-commercial services (shaping of the landscape, framework for living and leisure, protection against erosion...). An assessment of the true value of Mediterranean woodlands is difficult because they are progressively being disassociated from tangible production activity. In areas whose activity remains essentially rural, such woodlands are integrated into agri-silvi-pastoral systems of production in which they form a vital economic component.

THE PROBLEMS INVOLVING MEDITERRANEAN FORESTS AND NATURAL LAND AREAS

The evolution of Mediterranean woodland ecosystems is related to the types of use, exploitation and occupation of the land. Around the northern Mediterranean Rim, the desertion of rural areas by their inhabitants has given rise to a dynamic of spontaneous recolonisation of abandoned farmland by forest species. On the southern Rim, pressure from human occupation has led to inadequate regeneration of tree cover, resulting at times in degradation of conditions, with a concomitant decline in fertility of the soil.

When human influences disappear, a natural dynamic returns but remains difficult to foresee because human activity has gone on so intensely and for so long. At the present time, forestry management professionals lack valid guidelines for the sustainable management of Mediterranean ecosystems.

The problems involving woodland ecosystems can be approached via the dominant uses to which such areas are put. These areas are distinguished as :

- Areas used by a generally poor rural population. The management of such areas is subsumed into the problem of rural development.

* Project manager of the International Association for Mediterranean Forests.



- Areas abandoned by the rural population. The issue in these areas revolves around natural recolonisation by self-seeding species, which may well not correspond to what society at large wants to see happen.
- Areas subject to urban pressures or to a strong social demand (natural parks, peri-urban areas...). Here, conflicts are frequent between longstanding farming activity and other users. Issues confronting such areas involve protection, conservation and public access.
- Areas given over to wood production.

The interests of the people involved – owners or users – and the organisation of land ownership are not the same on the northern and the southern sides of the Mediterranean Rim (landholdings are basically private and dispersed to the north, but to the south are collective).

A change in the relationship to production, to the economy and to the regions has led to an evolution in expectations concerning the woodland areas. Most Mediterranean forests are little by little losing their primary function of wood production (this is essentially the case around the northern Rim, but the same tendency is beginning to appear in the eastern and southern parts of the Mediterranean, near centres of urban and tourist life). Their functions belong increasingly to the tertiary sector. These woodlands have become the preoccupation of town dwellers at the same time as the rural population, disparaging their value, withdraws its energy and activity from them.

The extent of the threat from risks (wildfire, erosion, plant diseases...) is related to the environmental, social and economic factors at work in these areas.

The perception of woodland heritage has evolved with the concept of what makes up a given area, along with the social representation of Mediterranean forests. These woodlands have enjoyed esteem, successively, for the zones they covered (grazing area, hunting...), for their potential as producers (wood, gathering activities...), then for their biodiversity and their role in landscape. A perception also depends on the historical and cultural context of each region and social group : a given area will seem to offer different potential according to the social group that occupies it, a given landscape acquires a different value according to time and place. Each group projects onto the forest its own perception of the world.

The orientation chosen to preserve or to manage woodland heritage cannot be universally applied. The type of forest wanted must first be decided on. At present, the predominating criteria for deciding what to protect are diversity of landscape and biodiversity.

The impending changes in the composition of

Mediterranean populations living in the various regions around the Rim will induce a change in the perception and the expectations relating to woodlands.

ORIENTATIONS PRESCRIBED AS A RESPONSE TO THE PROBLEM OF MEDITERRANEAN FORESTS

The management of Mediterranean forests cannot be designed in terms of models proposed for forests whose principle purpose is wood production. Recognition of the region's special characteristics would favour the adaptation of land use and development policies to the expectations and the needs of the inhabitants as well as to the specific features of the woodlands. Such recognition would facilitate the design of models that, taking into account the various uses to which these woodlands are put, would lead to ways of sustainable profit-taking from them. It is recommended that the problems related to Mediterranean forests be integrated into the issues of land use and development.

If woodlands are conceived of as being a form of heritage with a value, they will be protected and maintained. Obtaining such acceptance and respect will require better communications and raising consciousness.

Communications strategy should vary according to the outlook of the targeted audience : the way it feels about woodlands and what its vested interests are. The message about Mediterranean woodlands will vary depending on the dynamics of the plant cover, the land use organisation and the social groups involved. For example :

- for decision-makers, it seems advisable to stress promoting woodlands,
- for users, stress should be on the fragility of the ecosystems and their role in the fight against a trend to desert or in the regulation of the water resource,
- for landowners, the possibility of getting some income from their holdings.

At the same time, in order to take into account the complexity and specific features of these areas, it is desirable to push for forestry teaching more readily open to other disciplines and, in parallel, propose the inclusion of forestry training in other curricula.

As to the management of species that pose a threat to woodland areas, what is proposed is the development of preventive activity that will integrate the risks posed by such species into reflection on land use policy. The current realities of social and economic life (such as



land ownership patterns), because of their wider effects, must be taken into account in the management of risks that threaten Mediterranean woodlands.

It is felt that between 1 % and 5 % of wildfires are impossible to put out. It would appear better to manage such fires rather than to try to extinguish them at all cost. In some circumstances, a preventive woodland management system (suitable silviculture, controlled winter burning...) might be the solution, so long as interest in woodland heritage justifies the use of such means.

For a given situation, an acceptable threshold of risk could be defined, depending on, the probability of wildfire, the potential capacity to react and what is at stake. This threshold would then serve as the basis for determining policy on prevention and firefighting.

In the context of risk prevention, it would be very beneficial to develop technical cooperation and to set up a system for surveillance and for pinpointing areas at risk (from wildfire, erosion, pests and diseases). Such measures would enable available means and know-how to be pooled and facilitate foreseeing problems and proposing suitable remedies.

Drafting forestry policies requires the involvement of all those directly concerned.

Concertation and the exchange of information, particularly between researchers and decision-makers but also between researchers and professionals, would lead to greater efficacy. Such cooperation would limit both unnecessary duplication of activity and oversights and would favour a better use of the funds devoted to solving the problems related to Mediterranean woodlands. At present, there is no forum where the priorities for research into these woodlands are discussed.

TOPICS FOR FURTHER DISCUSSION WITHIN THE FRAMEWORK OF THE FIRST CONFERENCE ON MEDITERRANEAN FORESTS AND NATURAL LAND AREAS

The following themes have been proposed for discussion during the *First Mediterranean Conference on Forests and Natural Land Areas* :

Understanding Mediterranean forest systems and the means for their management

- Mediterranean woodlands seen as evolving social entities at the interface between societies and nature, and possessing their own history.
- An inventory of the goods and services, both commercial and non-commercial, issuing from Mediterranean woodlands and the highlighting of the special features that distinguish such woodlands from other types of forest.
- Regional approaches to the different aspects of these areas in relation to scientific research, other professional activities and political action involving Mediterranean woodlands.
- What techniques should be made available to make sure that forestry management takes into account the specific characteristics of Mediterranean woodlands ?
- How to find the means for managing such areas in accordance with the desires of society at large ?

Scenarios for the evolution of Mediterranean woodlands

- The ecological implications of human activity. What has been, and what now is, the influence of man on forests ? How can we forecast the effects of changes in society on such areas ?
- The effect of climate change on the ecology of these areas.
- The future evolution in the perception of Mediterranean woodland heritage and the attendant consequences.

Protecting Mediterranean woodlands

- The natural and socio-economic mechanisms underlying the risks that threaten Mediterranean woodlands (wildfire, climate change, urbanisation, agricultural use, desertification...). But, also, what are the policies and forms of behaviour that worsen or attenuate the consequences of such risks ?
- How can the issues related to managing risks be integrated into reflection on land use around the Mediterranean ?
- Defining risk management policy.

Concertation between the research sector and wider society on Mediterranean woodlands and the fostering of cooperation

- Reflection on priorities for research on Mediterranean woodlands.
- How can coordination be enhanced between research and training ?
- Defining a Mediterranean policy for forests.
- Developing a forum for concertation.
- How to establish a multidisciplinary research method for the Mediterranean ?
- The technical and economic assessment of on-site pilot projects which offer new perspectives for development for Mediterranean areas within the context of current transformations affecting wider society.

ECOLOGICAL SPECIFICITIES OF THE MEDITERRANEAN RIM*

(SYNTHESIS)

Carlo BIFULCO**

An understanding of the ecological characteristics of Mediterranean woodlands enables us to discuss the problems relating to their management, the implications for the people and issues involved, as well as the perspectives for future evolution.

DEFINING A MEDITERRANEAN REGION

Mediterranean regions are located on the western side of certain continents, at subtropical latitudes that stretch from between 30° to 40°, or between 25° and 45°, depending on the authority cited. Their climate is stamped by a marked lack of rainfall throughout the hot season and by winters that are too cold for the rainfall to be taken advantage of straight away. Thus, water-related constraints closely condition the biology of plant and animal organisms in these regions.

The regions possessing a Mediterranean bioclimate are the Mediterranean Rim itself, a part of California and Chile, the Cape area of South Africa, and the regions around Perth and Melbourne in Australia. In what follows here, the ecological features of the Mediterranean Rim alone will be dealt with.

ECOLOGICAL FEATURES OF THE MEDITERRANEAN RIM

Around the Mediterranean, the climatic conditions are sometimes so severe that rates of plant regrowth can be very slow and may even result in irreversible changes in plant cover.

Such environments derive their originality from the presence of mankind right from the very moment that a Mediterranean climate first emerged. The ecological effects of human action have been various. In some cases – traditional agriculture – it has led to greater diversity of landscape, resulting in the creation of numerous specific ecological niches ; in others – over-exploitation of forests and industrialisation – human activity has led to a process of erosion, giving rise even to desert conditions, and is no doubt responsible for certain changes in climate that have occurred or will do so in the future.

THE EFFECTS OF CLIMATIC CHANGE

The global rise in the Earth's temperature is expected to lead to :

- a displacement of isotherms towards the north,
- a change in rainfall patterns (a decrease at high latitudes, an increase at low latitudes),
- a rise in the sea level.

These changes in climate could have the following ecological consequences (in some cases, such modifications have already been shown to exist) :

- a change in species distribution patterns (towards the north and to higher altitudes),
- an alteration to the metabolism of certain species,
- a change in behaviour (settling of migratory species, change in the period of reproduction or of fertility...).

* Workshop held on 2nd and 3rd March 2000 in Naples (Italy).

** Director of the Vesuvius National Park (Italy), leader of this work group.



ECOLOGICAL FEATURES SPECIFIC TO MEDITERRANEAN FORESTS AND OTHER NATURAL LAND AREAS

The Mediterranean Rim is recognised worldwide for the wealth and specificity of its plant and animal life. The diversity in the range of habitats available to most species implies high variability in phenotypes. To give full weight to the diversity of Mediterranean woodlands, it is vital to take into account a whole spectrum of ligneous configurations (all types of scrubland and brush as well as certain grasslands and steppe).

The biodiversity of forests and other natural land areas around the Mediterranean varies from one place to another depending on the taxon (for example, some regions boast many endemic plant species but lack birdlife). This biodiversity is particularly notable in :

- the intermediary open, bush-type stages of cover rather than in mature forest stands,
- in areas that have been affected by human action only moderately.

On the whole, on account of the dynamics of their ecology, Mediterranean forests display low levels of wood production (compared with tropical or northern forests) but considerable non-ligneous production.

THE DYNAMICS OF MEDITERRANEAN FOREST ECOLOGY AND THE PROBLEM OF SILVICULTURAL MANAGEMENT

The northern rim of the Mediterranean (France, Italy and parts of Spain and Greece), as a result of the quitting of the land by the rural population, is being recolonised by forest tree species through natural self-seeding on abandoned agricultural land. This abandonment of farmland has certainly led to an increase in areas under forest but has also resulted in a trend to uniformity of forest ecosystems. The priority has become not so much reforestation as the management of already existing ecosystems. Forestry managers lack data on the sustainable management of Mediterranean ecosystems.

The forested areas of the south (North Africa and, to a certain degree, the south of Italy, Spain and Portugal) are subject to strong human pressures (livestock rearing, firewood collection, gathering foodstuffs and plant medicines...) which often lead to problems in the regeneration of tree cover and can at times result in deterioration of soils with concomitant infertility.

The difficult issue of forest ecosystems can be con-

sidered via the uses made of woodlands. The following situations can be distinguished :

- Forested areas used by a rural population which, by and large, is poor. The issue here is integrating woodland management into an overall policy for rural development.
- Areas of declining agricultural activity. Is human intervention necessary here ? It would appear important to identify areas in which the dynamics of plant cover do not coincide with the society's wishes and, if such wishes are to be achieved, human intervention will be necessary.
- Areas under pressure from urbanisation or from strong societal tendencies (areas near towns and cities, parks). In such contexts, conflicts with traditional agriculture over land use are frequent. These areas involve issues related to protection, preservation and public access.
- Woodlands given over to wood production.

THE ISSUE OF PROTECTING MEDITERRANEAN WOODLANDS

Their ecological dynamics make it clear that Mediterranean environments show great sensitivity to disturbance originating outside their systems. Measures to protect such natural areas would appear to be indispensable whenever they are near to dense population, on account of the intense pressure caused by the inhabitants.

Of all such areas, how do we choose those to be protected and by what criteria ? In managing such protected areas, what should be a priority ? Biodiversity may be one of the criteria ; in which case, to which aspect of biodiversity do we want to give priority ?

In certain cases, a choice might be made to preserve or to restore an area. However, the dynamics of the species in the plant cover can be difficult to identify because man's activity around the Mediterranean Rim has been so longstanding and intense. One cannot always decide which kind of silviculture to adopt for their management. Action to preserve or restore does not necessarily bring about the sought-after results.

THEMES TO PURSUE AT THE FIRST MEDITERRANEAN CONFERENCE ON FORESTS AND NATURAL LAND AREAS

For the *First Mediterranean Conference on Forests and Natural Land Areas*, it has been proposed that we



approach the ecological features specific to Mediterranean forests from various angles :

- forest management linked to ecological specificity : what tools should be used to ensure that forest management gives proper weight to these specific features ?
- the ecological consequences of human activity : what has been the influence of man's action on woodlands, both in the past and at present ? How can we predict the eventual effects on such areas due to changes in society (new relationships to production, to the economy and to the region itself) ?
- the effects of climate changes on the ecology of woodlands.



CIVILISATION AND HERITAGE*

(SYNTHESIS)

Andrée CORVOL-DESSERT**

THE PLACE OF MEDITERRANEAN FORESTS IN OUR SOCIETIES

In France and Italy up to the 19th century, Mediterranean woodlands were integrated into an agri-silvo-pastoral production system in which woodlands played a major economic role. The density of the rural population, at its maximum at this time, led to an over-exploitation of these environments by agriculture and an acceleration in the decrease of forested areas.

In this context there emerged an awareness of the fragility of Mediterranean woodland environments. The state then sought to protect these areas by opposing local peasant uses. A great number of conflicts broke out in reaction to the new regulations (relating to hunting, grazing...).

These conflicts between the state and the woodland users were evidence of a will to take over the areas under Mediterranean forest. They also highlighted the emergence of an awareness of the woodlands as heritage, and of nature generally.

The problem of the over-exploitation and the conservation of environments eased with the departure of the rural population. This departure was accompanied by an extension of the forest and a loss of peasant knowledge and skills in matters of forestry and pastoralism. In North Africa, the problems have been similar, even though the departure of the rural population only occurred in the 20th century. The population living in the woodlands remains high, though pressure on vegetation cover has decreased hand in hand with the reduction in the use of wood for heating.

The Mediterranean forest has become progressively tertiary, becoming less and less devoted to its primary function of production; and it is increasingly a preoccupation of city dwellers. At present, a large part of the

woodlands is unmanaged because rural society has withdrawn its commitment from its local territory, often dismissing the value of such areas.

THE PERCEPTION OF THE VALUE OF MEDITERRANEAN FOREST HERITAGE

A heritage is an entity whose value is economic or linked to use, which is maintained and which renders benefits. Thus, the conservation of woodland heritage implies its management.

The conflicting perceptions that society has of its woodlands are apparent through the different attitudes to the defence of forests against wildfire.

The fight against fire is generally organised around the risks that threaten goods and property situated in or near woodlands, rather than around the risks likely to threaten the woodland heritage itself. The protection of people and property remains the priority. On the whole, there is a disparity between the geography of the woodlands and the geography of protective measures. The defence of forest heritage is linked to the relative value attributed to it compared with that of other goods or property (residences...).

The departure of the rural populations who used fire in the management of the forest (controlled burning in the off season) or in fighting wildfire (counter-fires), along with the trend towards tertiary uses of the forest, have led to the criminalisation of fire which is seen as destructive of woodland heritage.

The perception of heritage evolves with the conception of local or regional territory and the representation made by society of its Mediterranean woodlands. Such areas have been successively esteemed for the territory they covered (hunting, pasturing...), for their potential in production (wood, produce gathering...), then for their biodiversity and their landscapes. The perception also depends on the historical and cultural context of

* Workshop held on the 8th March 2001 in Aix-en-Provence (France).

** Director of Research at the CNRS (National Scientific Research Council) (Paris, France) and chairperson of the *Groupe d'histoire des forêts françaises*, leader of this work group.

each region and of each social group. A given region offers different possibilities depending on which social groups occupy it. The value of a landscape can vary according to place and time.

Thus, the orientations chosen to preserve heritage cannot be universally applied. There must be a previous decision about the type of forest that is desired. Nowadays, the criteria that predominate in deciding policies for protection are the diversity of landscape and biodiversity. The value of biodiversity is itself assessed as a function of ecological equilibrium and the representation of it made by society.

PROTECTION AND CONSERVATION OF MEDITERRANEAN WOODLAND HERITAGE

Protecting a natural area means acting against pressures from outside which might provoke its modification. Its conservation, in the sense of fixing it in one state – a landscape, for example – can lead to intervention that will radically oppose any natural evolution.

Each social group projects onto the forest its perception of the world. The myth of untrammelled nature, synonym of earthly paradise, is deeply rooted in western society. Protecting the forest forces us to think about the relations between man and nature.

Is the aim of protection to be the subtraction of nature from any human influence ? Would such an approach effectively enable us to achieve the aim ?

Does this protection always require static conservation ? Is the fixity of heritage a real option ? Mummifying a situation or a landscape, as in a museum, would seem to be utopian because, like every biological system, landscapes age and cannot be maintained fixed without outside intervention.



SOCIETIES, TERRITORIES, INSTITUTIONS*

(SYNTHESIS)

Américo CARVALHO MENDES**

THE SPECIFIC SOCIO-ECONOMIC AND TERRITORIAL CHARACTERISTICS OF MEDITERRANEAN FORESTS

The characteristics of Mediterranean forests

The value of Mediterranean forests

The woodlands and natural land areas around the Mediterranean are characterised by their low production of wood and by the importance of their non-wood products or of their intangible services (leisure activities, landscape, tourism, framework for living).

In those parts of the Mediterranean Rim dependant on rural activity, such woodland areas are generally integrated into agri-silvi-pastoral systems of production. Near to urban zones, they are put to more tertiary uses. Assessing their value is difficult because their worth is less and less connected to tangible products but, rather, to the quality of the context in which lives are lived or to an area's attractiveness for tourism.

Furthermore, forests constitute a cultural heritage in all the countries of the Mediterranean Rim.

The organisation of societies centred around Mediterranean forests

The woodlands are publicly owned or belong to private owners. On the northern Rim, holdings are mainly small and private whereas on the southern Rim, forests are collectively owned (national government, religious communities...). Also, the category of private land-

owner is undergoing a real mutation due to the departure of the rural population and the arrival of non-rural owners.

Users belong to one of two groups : those who pursue activities that presuppose a forestry dynamic (producers or sellers of wood, inhabitants depending on woodland resources, livestock raisers, hunters...) ; or, on the other hand, those wanting the forest, as well as the landscape, to remain static, to accommodate leisure activities.

The diversity of Mediterranean woodlands is the result of different types of management, of their utilisation by their inhabitants and of the natural, cultural and historic heritage associated with a given territory.

Current problems faced by Mediterranean forests

Changes in the relationship to production, to the economy and to a territory, particularly noticeable around the northern Rim, have led to an evolution in society's expectations from its forests. The population is increasingly urbanised and tourism is on the rise. Woodlands are thus seen as a natural area for consumption and less as a zone for production or for gathering.

Such changes have also upset any existing rural equilibrium. A significant part of forests is no longer the object of any management because peasant societies have lost their commitment to their territory.

An opposition has arisen between landowners who, as a rule, do not exploit their holdings and users who demand protection and upkeep for the woodlands. Societal demands in relation to natural areas do not appear to be compatible with certain economic interests or the demands of development.

The problems and issues confronting forests around the Mediterranean depend on the socio-economic

* Workshop held on the 15th and 16th December 2000 in Torre del Greco (Italy).

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context of the countries involved. Moreover, given the multifunctional, multifunctional nature of these forests, and, also, the diversity of their users, they cannot be managed according to the northern European models that are regularly applied. In each case, it is preferable to take into account the different utilisations a given forest is the object of, and then envisage the means to ensure it will be able to sustain profitable use.

THE MEDITERRANEAN CONFERENCE ON FORESTS AND NATURAL LAND AREAS

The aims and expectations of the Conference

The model for land use in Mediterranean areas differs from the model based on area specialisation which is frequently used north of the Mediterranean region (in northern regions, zones of agricultural production are separate from those of industrial activity, residential sectors are separate from natural areas).

The objective of the *First Mediterranean Conference on Forests and Natural Land Areas* is to facilitate the design of an approach model for Mediterranean forests which will be adapted to the specific characteristics of such forests, to their newly emerging opportunities as well as to the constraints they have to face ; and, at the same time, will take into account their overall potential.

To this end, it is of paramount importance that the specific features of Mediterranean forests be recognised and, more particularly, that the issues and problems involving them be scheduled for consideration at international meetings concerning forests, so that such areas be better integrated into land use and development policy.

The Conference should be an occasion to :

- show the various examples of the management of Mediterranean woodland areas,
- reinforce cooperation between the political decision-making bodies, between ONG's (land-owner organisations, environmental associations, local development agencies...) and between researchers and those in the forestry profession.

Structure of the Conference

Rather than being a particular event, the Conference should be a stage in a process of cooperation. To ensure that it be a meeting place for all sectors of society and that the exchanges lead to effective collaborative construction, it would seem judicious that the Conference have :

- a political aspect with proposals for strategies and measures essential for the development of Mediterranean forests,
- a professional and scientific aspect with "workshop" discussions on topics arising from basic issues,
- an exchange aspect by which different experiences of development action can be compared through exhibits and reports on actual projects in the field.

The political aspect

The political aspect of the Conference could be a discussion of a resolution forming the basis of an International Agreement on forests and natural land areas to be submitted to the various institutional organisations.

This resolution should include the following ideas :

- the importance of a territorial approach,
- the need to design a Mediterranean model for the management and occupation of a territory,
- the necessity of approaching Mediterranean woodlands at the interface of their interaction with :
 - ♦ the protection of natural resources,
 - ♦ society,
 - ♦ the environment.

The aim of such a proposition is to broaden participation in the decision-making process without seeking to circumvent the prerogatives and dynamic of government institutions.

The professional and scientific aspect

All the themes relating to socio-economic and territorial aspects that should be investigated at the *First Mediterranean Conference on Forests and Natural Land Areas* approach the diversity and the multifunctionality of Mediterranean woodlands through different angles. The five themes proposed for consideration are :

- an inventory of the goods and services, both commercial and non-commercial, found in Mediterranean woodlands, and the highlighting of their specific features as compared to those

found in other types of forest,

- an analysis of approaches based on territory (these differ from an approach by sector of activity or from models of area specialisation) which integrate the implications of such areas for scientific research, professional activity and political action related to Mediterranean woodlands,
- an analysis of Mediterranean woodlands as social entities undergoing transformation, each with its own history at the interface of society and the natural environment,
- an analysis of the mechanisms, both natural and socio-economic, that underlie the risks threatening Mediterranean woodlands (wildfire, climate changes, pressure from urbanisation, agricultural uses, encroachment of desert...), along with the policies and patterns of behaviour which worsen or attenuate the consequences of such risks,
- a technical and economic assessment in the field, of the pilot projects which it is hoped will reveal for these Mediterranean areas new perspectives for development within the present-day context of radically changing societies.

The pilot site projects

In parallel to the Conference, it is planned to set up pilot site projects which, through the exchange of technical personnel, will engender reflection on the shared issues and problems of the woodlands. The following topics for cooperation have been suggested :

- the management of zones subject to environmental constraints, and the techniques of biological engineering,
- problems of land ownership,
- the management of zones subject to problems of wildfire (studying the socio-economic factors that contribute to outbreaks of fire),
- the problem of the abandonment of agricultural land and the lack of maintenance of the forests,
- the tertiary uses of Mediterranean woodlands,
- problems arising from small forest holdings,
- the monitoring of the evolution of a territory.

RISKS THREATENING MEDITERRANEAN FORESTS AND NATURAL LAND AREAS AND THE ROLE OF FORESTS IN RISK PREVENTION*

(SYNTHESIS)

Ricardo VELEZ MUÑOZ**

The hazards (fires, effects of erosion, pest attacks...) which confront Mediterranean forests and natural land areas are considered as risks whenever they directly affect society's interests.

The importance of these risks depends on what is at stake environmentally, socially and economically.

The evolution of these Mediterranean ecosystems is related to the types of use, exploitation and occupation of the land. In order that these areas evolve in the desired manner, it is useful to understand the risks they are faced with and to take into account their specifically Mediterranean dimension.

RISK OF WILDFIRE

The vulnerability of Mediterranean natural areas to wildfire

In the Mediterranean area, the problem of wildfire is extreme due to the particular climatic conditions there (rainfall pattern, summer drought...).

The impact of wildfire, which can be positive in some situations (opening up of forest cover), is measurable not only by its direct consequences on people and their possessions but, also, by the negative effects it has on the functions of the woodlands (wildfire radically alters those functions related to landscape, leisure, production, protection...).

The vulnerability of a location or area to wildfire is

conditioned by the consequences of this risk and by the capacity of reaction to it. The arrival in woodland areas of new residents not used to managing forested areas increases the vulnerability of such areas (likelihood of greater damage, of lack of know-how in the upkeep of these areas or of effective response to outbreaks).

The frequency of reoccurrence of wildfire, along with flooding, livestock grazing and assorted human pressures on burnt-out zones, are all so many factors that worsen the economic consequences of wildfire by limiting the regeneration of plant cover.

Action against wildfire

The consequences of wildfire often worsen when the rural population that has been involved in managing the woodlands leaves them. This is the case despite the development of technical means to combat fires.

An acceptable threshold for risk can be decided on in the light of the interests and issues involved, the likelihood of an outbreak and the capacity to react. Firefighting and prevention policy should be established as a function of the threshold.

The main thrust of policies related to wildfire focuses on the means for combating it. Even so, whatever the means employed, it is estimated that between 1 % to 5 % of all fires are impossible to put out. It would thus seem preferable to channel the fire rather than attempt to extinguish it at all costs.

Society has a choice : it can either take responsibility for removing some of the biomass ; or it can decide to allow forests to evolve free from human interference, with consequent major, unforeseeable changes.

Preventive management of forest (suitable silviculture, controlled winter burning...) could well be the

* Workshop held on 8th-9th June 2001 in Valencia (Spain).

** Head of the Wildfire Protection Service of the Spanish General Service for the Protection of Nature (Madrid, Spain), leader of this work group.

solution. However, this comes with a price tag and only an interest in woodland can justify setting up such management programmes. A social assessment of action undertaken up till now within the framework of forestry and woodland development (the impact of cutting firebreaks on the landscape...) would enable us to understand what has to be done to meet society's expectations.

Integrating the problem of wildfire into reflection on land use and development around the Mediterranean, taking into account the prevailing realities of social and economic life (notably the patterns of land ownership), would without doubt contribute to enhanced risk prevention.

The countries of northern Europe are not affected by this same issue of the problem of wildfire. It appears clearly desirable to design a forestry policy that is Mediterranean, eliminating the drawbacks contained in European legislation on wildfire and adapting it to the specific issues confronting Mediterranean regions.

EROSION

Erosion around the Mediterranean Rim

The Mediterranean area is characterised by a climate and a rainfall pattern that favour erosion. Clearing of woodlands and the pressure of human activity have led to imbalance and given rise to the dynamics of erosion (by water and wind) which may be aggravated by one-off events (outbreaks of fire, floods, violent rainstorms...).

Around the northern Mediterranean, large-scale replanting, along with industrialisation and the abandonment of the land by the rural population, has led to a reversal of this tendency.

The consequences of erosion

The consequences of erosion are :

- ecological : trend to desert, sanding up, drop in the fertility of soils...
- technical : silting up of dams, decrease in water storage capacity...
- economic : threat to the water supply, decline in yields of production zones.

Erosion may be immediately perceptible (floods, landslides...) or act more insidiously, over the long term or on a large scale, affecting whole territories and resources.

Action against erosion

Mediterranean ecosystems are fragile and complex and need to be approached in a global manner. The phenomena of erosion must be understood through their technical, environmental, economic and social dimensions.

Risks from erosion form an integral part of land use and development issues. Preventing these risks requires a combination of forestry techniques and civil engineering along with the application of the regulations governing land use and occupation.

Mediterranean forests are the main instruments for the protection of soils. The upkeep of forest useful for such protection is usually expensive. Such forests are not generally directly profitable but, nevertheless, contribute to increasing profitability of economic activity taking place lower down.

Indicating risk zones by the use of geographical information systems would lead to the effective use of available information and, also, permit the localisation of forests vital for the prevention of erosion. Much is known on the subject of combating erosion but little of the information is readily available.

The relationship between forests and the water resource is complex. However, it can be stated that in this respect forests act over time as purifiers and regulators.

Mediterranean woodlands also have an important function in the fight against encroaching desert.

RISKS TO PLANT HEALTH

The risk to plant health around the Mediterranean Rim

Pests can hinder the exploitation of stands, affect leisure activities or damage the landscape. The risks to plant health vary according to the behaviour and life cycles of the various organisms that cause disease or deterioration.

Endemic species can, at a particular moment, cause an epidemic. Some pests, taking advantage of climatic conditions they find favourable, spread. Their effects are often limited by the cold. Therefore, possible global warming is likely to lead to an extension of pests' presence.

The risks connected to non-endemic species are constant. The introduction, either voluntary or by chance, of new species (which include varieties accom-



panied by their parasites but without the predators of such parasites) can have unforeseen consequences on plant health. This risk has to be permanently monitored.

Some Mediterranean woodlands are more fragile than others because they grow in extreme conditions. Damage can often be spectacular. Mediterranean woodlands are composed of species possessing remarkable mechanisms for adapting to pests and drought. On the other hand, certain species are extremely fragile and their reaction to parasites is not always predictable.

Managing the risks to plant health

The absence of silviculture in tree stands favours the development of pests.

In silviculture, unlike in agriculture, insects and disease are not sufficiently studied. It is desirable that forestry professionals improve their knowledge of potential pests because the damage they cause has consequences for the structure of stands and operating conditions.

A surveillance system monitoring this risk would enable appropriate measures (areas to be treated, period of treatment...) to be taken. In Europe, health monitoring of forests exists on a very wide scale and enables the evolution of certain pests to be tracked. It would be beneficial to set up a damage monitoring network encompassing the Mediterranean Rim and based on criteria suited to this zone.

OTHER RISKS

Other risks exist such as those related to pollution or to introduced species that are invasive to the point of changing the woodland environment.

An interconnection can be observed between the different risks that affect Mediterranean forest species : thus, wildfire and erosion are related ; so are parasite attacks and drought (or pollution). Their effect can be cumulative.

The vulnerability of Mediterranean woodlands should be relativised in relation to time scale and the size of the area involved. This fragility depends on the purposes and functions assigned to a given area.

The prevention and control of the risks that threaten the woodlands cannot be achieved without involving both their owners, who are mainly private around the northern Rim of the Mediterranean; and, around the southern Rim, their users. In addition, the good use of local know-how in preventive action can be effective because, in the local socio-economic context of a territory, integrating such practices into preventive measures enhances the chances of overall success.

TRAINING, RESEARCH, RAISING PUBLIC AWARENESS*

(SYNTHESIS)

Michel BARITEAU**

MEDITERRANEAN FORESTS : RESEARCH AND TRAINING

The difficulties encountered in research and training related to Mediterranean forests

Research and training related to Mediterranean forests come up against difficulties linked to the lack of interest for these woodlands at the international level, a failure to see their value and the unsuitability of management concepts applied to them.

The forestry-related issues of the Mediterranean Rim are conditioned by the socio-economic context and the history of the regions involved. For some ten years now, these aspects have been taken into account but it has not been easy to integrate them into research and training programmes. Such integration has proved not only difficult to get accepted, whether by teachers and researchers or by decision-makers ; it is, moreover, difficult to set up.

Mediterranean woodlands have multiple functions, multiple forms and multiple users. Therefore, their management cannot be adequately carried out on the basis of models devised for the production of timber in regions with a clear separation between urban areas, farming areas and unexploited natural land.

People involved in the Mediterranean must propose their own models for reflection and research in so far as the dominant models commonly used have proved unsuitable for the Mediterranean context.

An understanding of Mediterranean woodlands as forming a coherent entity would facilitate relations be-

tween decision-makers and researchers. Specifically Mediterranean features of woodlands could be conceptualised with the help of forestry cartography, based on their various descriptions.

Matching research and training to society's expectations

The social utility of research is desirable and essential. Greater concertation between decision-makers and researchers, as well as between researchers and users (transfer of results) would enable priorities for research to be better matched to the issues confronting society at large. How to improve such concertation ?

Research on Mediterranean woodlands should match regional needs. However, around the northern rim of the Mediterranean, funding comes from European Community sources which often adopt priorities which do not correspond to the issues affecting Mediterranean regions. It would thus appear essential to define a Mediterranean policy for research ; at the present time, it has not been clearly established.

Teaching and training related to Mediterranean forests and natural areas is frequently oriented towards environmental management and the new technologies. The forestry dimension is for the most part dealt with through the issue of wildfire and the monitoring of its environmental impact. It is hardly justifiable to propose training based only on forestry management and it is difficult to integrate the socio-economic aspect. To adapt to this situation, people concerned with forestry must open up to teaching subjects that have been traditionally thought "non-forestry" but must also encourage the extension of silvicultural instruction to other curricula.

* Workshop held on 14th-15th May 2001 in Marseille (France).

** Director of the Unit for Research on Mediterranean Forests (Avignon, France), a part of INRA (National Institute for Agricultural Research), leader of this work group.

Structuring research on Mediterranean woodlands

The lack of coordination in the drafting of training and research programmes has led to the reduplication of certain topics, whereas there remain some themes that are inadequately dealt with. It would be desirable to harmonise programmes and promote exchange.

The problems in funding research derive from the scattering through various organisations of the people involved, along with the difficulty researchers have in concerting their efforts. A restructuring would enhance the likely eligibility of projects.

COMMUNICATING ABOUT MEDITERRANEAN WOODLANDS

Clearly stating the aims implied in raising public awareness about Mediterranean woodlands, and identifying the audiences for communication along with their (pre)conceptions, will facilitate adapting the nature and the contents of any message, thus increasing their impact.

What are the objectives of raising public awareness about Mediterranean forest ?

The difficulties encountered in trying to raise public awareness reveal the prevailing lack of interest by the general public in their forests. The main aims of communication are to fight against this general indifference, and to ensure that the features specific to Mediterranean woodlands get taken into account in management programmes at both national and international levels. How can decision-makers in the various regions be persuaded of the importance and value of their woodlands ?

Who are the targets of communication ?

There are three main groups to aim at : decision-makers, people using the woodlands and woodland property owners. Decision-makers should be the prime target.

As in the case of the landowners, it is often difficult to identify exactly who makes up the targeted audience.

What are the (pre)conceptions of the audiences ?

It is vital to identify the (pre)conceptions of each group because misconstruing the different approaches can result in creating obstacles to understanding the message. Depending on the social group, forests are seen in contradiction as :

- a resource or a natural environment,
- a developed area or an untouched tract (is forest management necessary ?),
- an area of dense vegetation or a place with open spaces in varying degrees.

Considering Mediterranean woodlands from the perspective of the audience – seeing what such woodlands mean for the receiver of the message and what key advantages they can get from them in the context of local social and economic issues – will enhance the efficacy of the communication. The woodlands of each region are characterised by a specific function and interest which are determined by the local socio-economic context : this specific interest must be identified.

What messages to communicate ?

The type of discourse to be adopted will differ depending on the dynamics of the vegetation and the type of social organisation : the interests of the population – owners or users – and landowning patterns – scattered private plots or publicly owned – are not the same to the north and to the south of the Mediterranean. Nevertheless, there remains the same need to raise awareness about the importance of Mediterranean woodlands.

Discourse has different emphases :

- The protection of habitats. It emphasises their fragility and the risks to which they are exposed. Around the northern Rim, the prevention of, and fight against, wildfire is the federating message.
- The promotion of woodlands. It emphasises the strengths and richness of woodlands via their biodiversity, their integration in age-old civilisations. Mediterranean woodlands are atypical but possess key advantages that should be highlighted : though less spectacular, these woodlands are a patchwork, composite, inhabited, astutely developed in regions of longstanding civilisation, full of light, rich in aromatic plants and forms of landscape, and harbouring great biodiversity.

Which message should get priority ? It is difficult to isolate one federating message related to the specific-

ties of the Mediterranean yet also addressing regional preoccupations. The complexity of Mediterranean woodlands and the diversity of the target audiences imposes a variety of messages according to the situation :

- when aimed at decision-makers, stress should be put on the promotion of Mediterranean woodlands so as to widen the scope of policies that are often limited to protection against wild-fire,
- when aimed at users, emphasis should be on the fragility of the Mediterranean environment and the role of the different habitats in combating the spread of desert, in regulating the water resource...
- when aimed at woodland owners, it should be stressed that they can raise income from their property by sound management that takes into account the specificity of their woodlands.

tactics to associate woodlands to other more eye-catching topics such as art, literature, culture or fine food, but also to issues such as global warming, the carbon sink... However, can one reconcile hard-hitting media impact and scientific exactitude ?

What channels should be used in trying to raise public awareness about Mediterranean woodlands ? Television would not seem to be a good vector because forests are not really news. The radio seems to hold more promise, especially for woodland users around the southern Rim. Publishing could be effective for the general public and for landowners (manuals, documentation...). The use of certification and official listing could be a telling method in the light of the preoccupations of European policy-makers who design policies in which Mediterranean woodlands need to be integrated. Effective communication with the general public is also an indirect path to reaching the decision-makers.

Which channels of communication to use ?

Woodlands are not a newsworthy topic unless they burn or fall victim to natural disaster. It appears good

COOPERATION*

(SYNTHESIS)

Jean BONNIER**

THE AIMS OF INTERNATIONAL COOPERATION FOR MEDITERRANEAN WOODLANDS

Asserting and highlighting the specific features of Mediterranean woodlands and natural areas in their characteristic ecological, social, economic, cultural and institutional aspects is of paramount importance in any policy for international cooperation. Stressing these characteristics will encourage their being taken into account in the decision-making process and so better ensure that any action undertaken will better suit the needs of the people involved in these areas.

The design of forestry policies adapted to the regions and to the expectations of the societies living there requires the involvement of all potential partners. Projects will thus more likely emerge from the needs of local stakeholders and be shaped by the prevailing local issues.

The main aim of international cooperation on Mediterranean woodlands is to obtain models for the development and use of land in the regional entities and in their woodland and natural areas that will meet the expectations of Mediterranean societies and, at the same time, fit in with the specific features of these environments.

PRIORITIES IN THE FIELD OF INTERNATIONAL COOPERATION

Understanding of Mediterranean woodlands

Despite numerous studies, mostly scattered and uncoordinated and, thus, neither cumulative nor easy to compare, a need was felt for an audit of the present situation, including the need to deepen understanding of the biodiversity of habitats and their foreseeable evolution. Such studies must take into account prevailing local conditions (erosion, advance of desert, health of stands, pollution...) as well as social context (land-holding patterns, public expectations, the importance given by the population to its woodlands...).

It is also hoped there will be better understanding and spreading of traditional knowledge and, also, of the uses of Mediterranean woodlands, their recent evolution and the evolution in conflicts arising from their use.

The cost-effectiveness of woodlands in their social function, as well as their total economic value, need to be measured in the light of the fact that commercial products form an ever-decreasing part of the income of local societies.

In each of these fields, real benefit would result both from concerting work and efforts, thus reducing redundant action and failings, as well as from the type of cooperation that would facilitate the spread of information on individual experience.

Research networks, either strictly Mediterranean (like *Silva Mediterranea*) or more wide-ranging (EFI, IUFRO, MAB), already exist. However, there is no one place where research priorities are debated. Furthermore, just about all research programmes suffer badly from a lack of an interdisciplinary dimension.

* Workshop held on the 5th November 2001 in Marseille (France).

** Executive secretary of the International Association for Mediterranean Forests, leader of this work group.



Training

The social character of Mediterranean woodlands demands that the education and training given to forestry professionals be given a broader interdisciplinary base and, also, that students in other disciplines learn about forestry issues during their initial or further training. Such a development implies greater concertation in the designing of syllabuses.

It would also be desirable to coordinate courses in Mediterranean forestry as offered by the various institutions around the Mediterranean Rim.

Managing woodland areas

On the question of international cooperation for the management of woodland areas, stress was put on :

- management techniques for naturally occurring forest, for the introduction of foreign species, for reforestation and for "biological engineering",
- the encouragement of specific action relating to the multiple social functions of woodlands, including that of production.

In order to achieve concerted management policies that will also be better adapted to real needs, it is of vital importance that there be meetings and exchange between the different landowners (public or private) and, also, that new partners who have emerged via the process of decentralisation or from the ONGs be taken into account

The development of cooperation related to the fight against wildfire or to the threat from pests and diseases has been judged necessary (sharing firefighting equipment and arrangements, pooling of data or a contribution to the conception and design of methods). Existing networks are either not especially Mediterranean or are not much used.

Communication

Mediterranean woodlands are now hardly taken into account in the organisation and development of land use in the regions. Their economic significance is often eclipsed by the problem of wildfire.

Putting together a shared communications policy grounded in the social, technical and administrative reality of Mediterranean woodlands is a necessity in order to : vanquish the lack of interest shown by whole societies for their woodlands ; help bring about a rapprochement between silviculture professionals and environmentalists ; and get recognition for the role of landowners (public or private) as well as those involved in woodland management.

CONDITIONS FOR INTERNATIONAL COOPERATION

An assessment of the cooperative projects currently under way around the Mediterranean Rim would enable us to identify any failings and bottlenecks and the causes of them.

Apart from *Silva Mediterranea*, there are few general networks in international cooperation devoted to Mediterranean woodlands. In the absence of any clear allocation of responsibilities relating to these woodlands, the International Association for Mediterranean Forests is justified in seeking to partially fill the vacuum in order to foster the emergence of certain models for Mediterranean woodlands.

It has been proposed to try out cooperation "at grass-roots level" through concrete operations conducted at pilot sites.

Partner regional authorities will choose sites (drainage basin, natural park, rural district...) which will be the locus for the exchange of people and knowledge. Such exchanges will explore the ways for transferring methods and processes. The results obtained will be assembled and made known to the different interested parties, notably through the *First Mediterranean Conference on Forests and Natural Land Areas*. The whole will form the basis of a shared corpus of knowledge on Mediterranean woodlands.

The financing of international cooperation is an essential point which will need to be considered.

MINUTES OF THE WORKSHOPS



ECOLOGICAL SPECIFICITIES OF THE MEDITERRANEAN RIM*

Carlo BIFULCO**

INTRODUCTION

The seminar on "The Ecological Specificity of the Mediterranean Rim", led by Carlo Bifulco, belongs to the European Union Interreg IIC programme "The Problem of the Mediterranean Forest".

Francesco Gaeta reminded participants that this programme forms part of the EU's policy for regional territories which seeks to transform such territories into elements of cohesion rather than of division. The "Mediterranean forests" dimension is vital to the identity of a Mediterranean Europe which, by virtue of the Mediterranean Sea, maintains close and privileged links with all the countries around its Rim. The need for cooperation with the countries on the southern part of the Rim was also specifically emphasised.

Mohamed Larbi Chakroun observed that this work group seminar was an encounter of technical people coming from various backgrounds, with different methods of approach to Mediterranean issues and much experience of action undertaken, research... The seminar would enable people to exchange information and to identify the topics and themes to be debated at the *First Mediterranean Conference on Forests and Natural Land Areas*.

In a first stage, the ecological characteristics specific to the Mediterranean Rim were presented in order to facilitate understanding the problems and issues related to managing Mediterranean forests and assessing the perspectives for their evolution. Different statements about the present situation led participants to reflect on the means and criteria for protecting Mediterranean woodland areas and on the importance of such protection, given the specific nature of the environments involved.

Taken all together, the contributions have made it

possible to detail the key aspects and, also, a methodology and the lines to be followed in preparing the First Conference.

CHARACTERISTICS OF MEDITERRANEAN ENVIRONMENTS

Geoclimatic characteristics of Mediterranean regions

Vincent Clément recalled the definition of a Mediterranean region : Mediterranean regions are located on the western side of certain continents, at subtropical latitudes that stretch from between 30° to 40°. The Mediterranean environment is stamped by a climatic feature unique in the world : a marked lack of rainfall throughout the single hot season. The summer drought is related to the appearance and swelling of subtropical anticyclones.

The Mediterranean and its Rim are located at the westernmost part of the Euro-Afro-Asian land mass. The 40° limit excludes the French Mediterranean region as well as quite a large part of Italy (both of which nevertheless display typical Mediterranean vegetation) and, also, Baja California in Mexico, and southern California in the United States. It is for this reason that Guy Benoit de Coignac prefers to broaden the definition : he considers that the Mediterranean regions lie between 25° and 45° latitude.

In the southern hemisphere, this definition thus includes Chile, the Cape area of South Africa, and the regions around Perth and Melbourne in Australia (this latter being considered as a continent). In the northern hemisphere, the two Californias, Mexican and American, are included along with the Mediterranean Rim.

All these regions possess a climate and vegetation that is Mediterranean. Their woodland habitats are very

* Workshop held on 2nd-3rd March 2000 in Naples (Italy).

** Director of the Vesuvius National Park (Italy), leader of this work group.



strongly characterised by the competition for water among their living occupants.

Geological specificity of the Mediterranean Rim

According to Valeria Zamparelli, the Mediterranean Rim displays specific characteristics that are both biological and geographical. All the relief bordering the Mediterranean Rim has a common origin. From the end of the Cretaceous period (65-60 million years ago), there occurred the closing off of the ancient Mesogean Ocean, with the formation of the present-day Mediterranean area and the orogenesis of the Pyrenees, Alps, Apennines and Carpathians, as far as Anatolia. The closing off which preceded the emergence of the Apennines and the formation of the Tyrrhenian Sea began 10 million years ago. All relief bordering on the Mediterranean is thus recent and displays strong geomorphological dynamics. Tectonic movements have lowered some regions and, through alluvial deposits, enabled the formation of broad plains such as that of the Rhône and all those that border the Mediterranean zone.

The immense glaciers of the Quaternary era had a major influence on shaping the rocks. Over 2 million years, there were 17 successive climatic cycles of 100,000 years each. This led to great transformations in the landscape and to morphoclimatic imbalance. In some places, the movement of the rock is visible on the fault planes. The modelling of the folds has been dependent on climatic conditions.

This substrate interacts with the other components of the "earth" system, notably with man. An understanding of geomorphology and of the bedrock is fundamental to assessing both the threat from natural risks around the Mediterranean Rim as well as its resources.

Importance of the human factor in Mediterranean environments

Guy Benoit de Coignac remarked that these environments derive their originality from the presence of mankind right from the first emergence of a Mediterranean climate. Humankind forms part of the Mediterranean ecosystems and has always deeply influenced their evolution.

Jacques Blondel confirmed that to deal with any issue relating to the sustainable development of Mediterranean woodlands, one must take into account mankind who, throughout history, has always played a major part in biodiversity. It is possible that what is

termed a forest "climax"¹ has never existed around the greater part of the Mediterranean Rim.

The importance of the human factor is a constant in issues concerning Mediterranean forests. The role of man in Mediterranean systems is complex because his role has by no means always been synonymous with a threat to biodiversity.

Vincenzo La Valva noted that the ecological consequences of human action are indeed various. Some are positive : traditional agriculture has led to a greater diversity in landscape and biodiversity by the creation of new ecological niches. Others are negative : the over-exploitation of forests causes problems of erosion and encroachment of the desert. Industrialisation is no doubt the origin of current problems relating to climate.

J. Bonnier thought that the human factor has been structurally essential to Mediterranean woodlands. It is a matter of an ecology that encompasses man, as was born out during the seminar by the large number of contributions made on behalf of institutions and people involved at ground level (farmers, forestry organisations, parks, nature reserves...).

Georges Aillaud stressed the fact that Mediterranean landscapes have resulted from man's activity over thousands of years. Their remarkable appearance is linked to the importance of perennial plant cultivation (vineyards, orchards) which give a characteristic stamp to a region. What seems natural turns out, in the final analysis, to be a once-exploited area later abandoned.

Sofia Romano remarked that agriculture is no longer only concerned with food production but also has a social role in maintaining the environment. Farmers have become involved in issues related to safeguarding natural habitats, environment-friendly methods, water conservation and biodiversity.

Richness of Mediterranean biodiversity

Diversity of species

The Mediterranean Rim is characterised by an outstanding diversity of both plant and animal species. Vittorio Ducoli stated that Mediterranean habitats, along with tropical regions, display some of Earth's greatest biodiversity.

On this aspect, J. Blondel cited this expression from Myers : "The Mediterranean area is considered to be

¹ A climax is the final stage in the evolution of an ecosystem that has been subject to no outside interference.



one of the world's biodiversity hot spots." A quick inventory gives some idea of the range involved : the terrestrial species of Mediterranean plants and animals include :

- 25,000 higher plants (7% of the estimated world total),
- 165 reptiles,
- 63 amphibians,
- 197 mammals,
- 366 birds ...

V. La Valva pointed out that of the plant species around the Mediterranean Rim, 15 % are endemic to southern Italy.

Francisco Castro Rego also emphasised the high level of biodiversity in Mediterranean woodlands and regretted that this aspect is not highlighted when comparisons are made to other forests.

By virtue of their diversity, Mediterranean environments are prime subjects for research. Paolo Cornellini drew attention to the usefulness of plant diversity for research in environmental engineering. Such environments have a strategic importance, also, because they are a significant source of raw materials.

Maurizio Fraissinet stressed the importance of Mediterranean woodlands for birdlife. They enable not only many Mediterranean species to survive but also others coming from throughout the European continent (migratory species find favourable habitats here).

Diversity of habitats and multiplicity of ecotypes

J. Blondel remarked on another characteristic of Mediterranean environments : the diversity of habitats seen in the light of whole populations. The heterogeneity of Mediterranean habitats leaves its mark on organisms by inducing a high variability in phenotypes, a phenomenon itself often associated with great genetic diversity. A property of Mediterranean areas is that they induce selection-producing pressures that cause micro-evolution manifested by the emergence of local ecotypes, especially in island contexts. Species diversity is no doubt only the tip of a variation "iceberg".

THE ORIGINALITY OF MEDITERRANEAN FORESTS

The diversity of Mediterranean woodland environments

In J. Blondel's view, the notion of forest, more particularly in Mediterranean regions than elsewhere, must not be restricted to plant cover whose structure brings to mind the classic expressions of this word. Forest here must be expanded to include the whole range of "peri-sylvan" formations : such are all types of bush cover designated by terms like matorral, fruticetum, garrigue, as well as a large part of steppe and grassland.

Abdelhamid Khaldi estimated that if only strictly defined forest cover is considered, that is to say tree stands as foresters understand it, then in North Africa (from Egypt to Morocco) such forest covers only 1 % of the territory. If other types of cover are included (steppe, extensive grazing routes), then the extent of such land is much greater, even if it remains less than around the northern part of the Mediterranean Rim.

Specificity of the products and functions of Mediterranean woodlands

Mediterranean forests are notable for their low level of wood production. A. Khaldi explained that, in North Africa, the finest stands (of cedar, oaks, pines) are not profitable, or hardly so, for wood production.

On the other hand, such forest produces non-ligneous products, sometimes termed secondary products, that can turn out to be much more profitable than wood production. For example, at the present time in Tunisia, one hectare of Aleppo pine yields a higher turnover from seed production (used in making a highly prized delicacy, *assidat*) than from wood.

In Guy Benoit de Coignac's view, in the final analysis wood should be seen as a by-product of Mediterranean woodlands. Mediterranean forests cannot be competitive in wood production. It would be better to emphasise the products and services that do not stem directly from wood production.

Américo Carvalho Mendes insisted on the non-commercial goods and services provided by Mediterranean woodlands : these aspects, positive for society as a whole, are apparent in terms of leisure, landscape, tourism and the general framework of normal life.

ISSUES IN MEDITERRANEAN FOREST MANAGEMENT

The extension of woodlands around the northern Rim and their new functions

The issues and problems concerning forests on the northern side of the Mediterranean recur in France, Italy, a part of Spain, Greece and in Turkey. Michel Bariteau outlined the case of Mediterranean woodlands in France.

Here, forest has considerably increased over the last century. This situation has resulted from the quitting of the land by the rural population and the progressive abandonment of farmland. For a number of years, most of the expansion of woodlands has been due less to replanting than to recolonising by forest tree species through natural self-seeding on abandoned agricultural land. A decline in grazing and in coppicing has also meant an increase in areas under forest.

As of now, reforestation is no longer thought of as being a key element in forestry policy. Priority is little by little being given to the management of existing ecosystems.

Faced with such plant dynamics, the forestry manager is short of references on the sustainable management of Mediterranean ecosystems. The longstanding equilibrium of the rural context has been upset and the resulting imbalances no longer allow management of open habitats (and the maintaining of biodiversity, which is locally affected by the closing over of such habitats).

The demands of society vis-à-vis its woodlands are evolving, becoming more complex. Forests are now seen as natural, untouched areas. The countryman is being progressively replaced by city dwellers and tourists. User conflicts have become frequent.

A. Carvalho Mendes reiterated that the new functions correspond to non-commercial services. The financing of woodland systems given over to landscape, tourism or social action remains a problem because such systems do not produce a direct return.

Pressure from population growth around the southern Rim and problems of renewing plant cover

A. Khaldi stressed the special features of woodland areas around the southern Mediterranean Rim, features which are also found to a lesser extent in the south of

Italy, Spain and Portugal. These areas are available for very varied uses : livestock rearing, source of firewood, gathering of foodstuffs, and the harvesting of assorted non-ligneous products.

At present, the population inhabiting the woodlands is very large. In these zones, the main activity is traditional farming. Through land clearance, the woodlands have undergone severe pressure from human activity, a situation that worsened throughout the 20th century.

Nowadays, the question of the regeneration of tree cover and stands and their sustainability has become a topical issue. For example, for two main species (cork oak and Aleppo pine) there is only very weak, or even no, regeneration.

The deterioration of woodland cover and the difficulty of its regeneration are factors that increase problems linked to erosion, decline in soil fertility and the encroachment of desert.

Typology of forest ecosystems as a function of their uses

Jean de Montgolfier proposed identifying the issues concerning forest ecosystems as a function of the uses made of these areas. He distinguishes four main types of woodland :

Woodland areas used by a generally poor rural population

In earlier times, this was the prevailing category around the whole Mediterranean Rim. Nowadays, it occurs almost solely around the southern Rim and in the eastern Mediterranean. Management of such areas forms part of the problem of rural development. One of the aspects mentioned was the taking into account of specific ecological characteristics in integrated development (previously, the term used was ecodevelopment). The interest of experience on this issue in Morocco and Tunisia should be underlined.

Rural areas undergoing decline

The problems of management in rural areas undergoing decline raise the question of whether man should intervene or not. When should intervention occur ? Some wooded areas are totally artificial (for example, sweet chestnut forest) and their upkeep in a suitable state is not possible without human intervention. We need to identify those areas where plant dynamics are not moving in the desired direction and where, if the

desired aims are to be attained, human action will be needed.

Woodland subject to urban pressures and social demand

Towns and cities push outwards towards peri-urban woodland in response to the pressure to urbanise. Added to this pressure is the demand on the part of city dwellers for natural areas to be used for recreation (leisure, landscape, framework of life). Such demands, occurring along with more traditional uses, provoke user conflicts and give rise to the development of issues of protection and conservation of environments as well as to the question of how to receive the visiting public. Such issues do not only concern peri-urban areas but parks and nature reserves also.

Forest devoted to wood production

It is important to state that there are Mediterranean forests that produce wood. What are the circumstances in which such activity is profitable ? Here, the questions needing in-depth consideration are related to understanding the characteristics of forests capable of giving value for effort in wood production.

PERSPECTIVES FOR THE EVOLUTION OF MEDITERRANEAN ENVIRONMENTS

Current dynamics

The exposé on current issues and problems concerning woodlands showed there were two opposing tendencies : on the one hand, a dynamic of extension around the northern Rim ; and, on the other, of deterioration around the southern Rim.

M. Bariteau noted the extreme speed with which Mediterranean woodlands evolve whenever human activity is involved : abandonment of farming to the north, continued demographic pressure to the south. Both these trends are worrying because, eventually, they threaten to result in forest wilderness around the northern Rim and a mineral desert around the southern.

Heightened sensitivity to climatic change

J. Blondel explained that areas characterised as Mediterranean correspond to climatic anomalies and for this reason are particularly sensitive to changes in climate. They are most likely to be the first affected by a speed-up in such changes.

The global rise in our planet's temperature is expected to lead to a displacement of isotherms towards the north and the presence of plant life at higher altitudes. There will also be a variation in rainfall patterns, with a change in distribution : a decrease at high latitudes, an increase at low latitudes. Lastly, the sea level will continue to rise.

These changes in climate could have three major consequences for animal and plant life :

- a change in species distribution patterns, with extension towards the north and to higher altitudes,
- physiological alterations to metabolism, mechanisms of assimilation, growth rates, photosynthesis, respiration...,
- a change in behaviour and overall biology : settling of migratory species...

This problem of climate change has become increasingly worrying as, over the last twenty years, the intensity of change has accelerated. J. Blondel considers that a study of the consequences of climate change for Mediterranean woodland ecosystems should be a priority subject for research.

M. Bariteau stated that the now commonly accepted objectives of sustainable development imply taking into account forecasts of the effects of climate change.

PROTECTION OF MEDITERRANEAN FORESTS : THE ITALIAN EXAMPLE

Setting up protected areas in Italy

V. Ducoli explained that conservation is indispensable in areas of high population density. Today, only 17 % of the original forest cover still exists. This shrinkage has been due to intensified occupation of the coast, along with the use of wood for fuel and building. The abandonment of farmland has made possible an extension of wooded areas. However, this has led to a standardisation of forest ecosystems. The conservation of woodlands to ensure the maintenance of biodiversity and forested areas of quality appears as clearly necessary.

Fernando Fuschetti stated that before 1993 (Act 33 of 1993), the protected areas in the Vesuvius and Cilento National Parks represented only 1.5 % of Campanian forest. Since this Act, five new parks have been created and protected areas now represent 30 % of Campania's woodlands. This situation is seen as positive for the management of the region's forest resources as well as for the defence, protection and development of forests.

Act 11 of 1996 introduced financial grants for silvicultural operations and the development and improvement of forested and mountainous areas. Both public and private owners can obtain such help.

Role of protected areas

V. Ducoli explained that the role of a protected area is not limited to the conservation of forests. Such areas serve as experimental sites where new systems of territorial management can be tried out.

Completely protected conservation of forested sectors

Conservation areas providing total protection have been established with the aim of acquiring fundamental knowledge that should be useful in forest management (individual application of evolving dynamics, succession of cycles). A network of completely protected reserves would enable information to be exchanged.

Definition of forest management systems

The term "forest management system" takes into account, besides plants, the other components of a forest system (soil, wildlife, legislative and regulatory framework...).

The most advanced techniques of naturalist silviculture can be applied in such systems.

Naturalist silviculture allies knowledge about forest dynamics with the exploitation of forest resources to attain a high degree of "naturalness" in the forests. This approach cannot be reduced to the application of pre-determined parameters. Each situation implies different choices based on an appreciation of each dynamic.

Education and raising awareness

V. Ducoli also pointed out the educational role played by national parks. People responsible for their management must devote effort to making the wider public aware of the issues in forest management.

Problems and issues in running the Italian national parks

The Cilento National Park comprises 180,000 hectares spread over 80 municipalities in the south of the Campania Region, in southern Italy. V. La Valva explained that in parks with a resident population, any problems are that much more delicate to solve in that the residents want definite answers. Not only is it a question of conservation, but also of surveillance and management.

The management of a park goes hand in hand with the socio-economic development of a region. This development must be integrated (viable both ecologically and economically). Even so, how can such development be achieved? To what set of dynamics should one refer? What silviculture should be practised?

Concerning the Vesuvius National Park, Nicolà de Fusco made a number of points:

- The forest on Vesuvius is very extensive but includes few species that can be exploited. Consequently, little maintenance work is done. Some upkeep may need to be carried out.
- The "renaturalisation" of the forest should be envisaged and brought about. Over the last 30 years, foresters have replanted with conifers. In Campania, conifers are merely the beginning of an evolving process of plant dynamics. It would be judicious to progressively replace the conifers with native broadleaved species.
- Risk prevention has a very important place in Park management, especially the risk from wildfire but, also, the hydro-geological risk (particularly high in Campania).

A further aspect of national park management concerns the reception of the public. V. Ducoli explained that the number of tourists, increased by advertising, exposes parks to wildfire (during the last decade, the number of outbreaks in the Mediterranean zone has risen a lot). Generally speaking, tourists are unaware of the norms and conditions for safety that must be respected in woodland areas. This is a contradictory situation for park management.

STRATEGIES FOR PROTECTION AND THE DIFFICULTIES SPECIFIC TO THE MEDITERRANEAN RIM

According to François Romane, attempts to restore and conserve plant cover around the Mediterranean Rim are difficult to master and then manage. Such difficulties, especially those related to the choice of which forest environments to protect, are much less acute in the temperate forests elsewhere in Europe.

BIODIVERSITY AS A CRITERION OF CHOICE

J. Blondel pointed out that one of the difficulties in the management of protected areas is the choice of what gets priority. Areas that appear as especially sensitive from the point of view of biodiversity are not the same, depending on which taxon² is being considered. Some regions that are particularly rich in endemic plants, notably islands, are much poorer in mammal or bird species.

He also reminded participants that landscapes which comprise different compartmentalised habitats during an ecological succession (as occurs with the various stages of matorral, for example) are subject to major and unforeseeable variations.

Studies have shown that the diversity of species particular to a region is more apparent at the intermediate open bush stages rather than in the old mature forest stands. It is thus necessary to include in the definition of a Mediterranean forest the whole range of woodland environments that are really or potentially forest but which, either through the impact of man or *sui generis*, are at some remove from the standard idea of a forest.

The established knowledge we have of the influence of man on the emergence of forests and their biological diversity is a worthwhile subject for research. Analyses of biodiversity have led to demonstrations that maximum biological diversity is not found in the primeval forest *strictu sensu* but in areas of moderate human impact (traditionally farmed areas).

Choice of a stage as reference

One of the specific features that has stamped the whole Mediterranean Rim is how longstanding and intense human activity has been in the environments

² Taxon = a group of species

there. F. Romane deduced that it is difficult to know what plant cover could bear witness to a climax situation. It is thus a tricky affair to stipulate an environment as the reference for conservation and restoration.

Guy Benoit de Coignac restated that it is no doubt illusory to speak about climax in a Mediterranean context, given the degree to which man has been involved in the ecosystem.

Paradoxes of conservation in an environment so highly influenced by man

F. Romane explained that protection based on stopping human impact results in most cases in plant cover different from that initially protected. This replacement vegetation would definitely be closer to the growth of a climax.

Ambiguity of the notion of deterioration

Mediterranean environments have a strong capacity to react to external disturbances. Such disturbances can result in an increase in biodiversity. Thus, F. Romane described the case of evergreen holm oak coppice which, after wildfire, displayed an increased wealth of species over at least several years. Should such holm oak forest be allowed to burn then, on the simple basis of this observation ? Or, to be less provocative, should fire be seen as a "necessary evil" ?

Such questions raise the problem of the choice of environments to be fostered and the concept of deterioration. J. Blondel explained that deterioration gives rise to intermediate stages possessing great biological diversity.

Need for political recognition of Mediterranean biodiversity

F. Castro Rego drew a parallel between Portugal and Sweden : Portugal possesses a greater number of plant and animal species than Sweden yet the national budget and European grants for the conservation of biodiversity are considerably less in Portugal !

Overall, he noted that the countries with the greatest biodiversity are those with the least means for conserving it. This is especially obvious in Europe where the Mediterranean region gets little help despite its rich

biodiversity.

It is to be hoped that the ecological specificity of the Mediterranean Rim be considered from an economic point of view and from the point of view of regional territorial management. This last could be adopted as one of the aims of the *First Mediterranean Conference on Forests and Natural Land Areas*.

C. Bifulco restated for the non-specialist that the risks threatening Mediterranean forests are not so great as those confronting the Amazon rain forest (intensive clearance). But the conservation of natural heritage and biodiversity at a global level also involve Mediterranean woodlands.

Mediterranean forests represent for the countries of the Mediterranean Rim something of great cultural and economic worth and the cooperation and exchange concerning these areas, already characteristic of relations between peoples of the ancient world, should be revived. The safeguarding of Mediterranean woodlands is the hallmark for preserving the entire natural and cultural history of the Mediterranean world.

METHODOLOGY FOR PREPARING THE CONFERENCE

Aims

The overall aim of the *First Mediterranean Conference on Forests and Natural Land Areas* should be the mobilisation of all the people involved in these woodlands and areas, along with the recognition of the importance of such woodlands and the highlighting of their needs in terms of management and protection.

During the seminar, participants identified several precise objectives towards which the Conference should tend in order to achieve its aims.

F. Castro Rego hoped that the Conference would be the occasion for major scientific, technical, political and economic contributions in the field of natural Mediterranean areas so that the issue of Mediterranean biodiversity may be seriously taken into account in regional territorial land use policies and in the distribution of funding, especially from the EC.

G. Aillaud insisted on the notion of a Mediterranean entity and the need for committees at an international level that focus specifically on the Mediterranean world.

In a wider perspective, A. Khaldi thought that it was important to encourage cooperation and that the IAMF should collaborate with international bodies such as the

FAO. In addition, he referred to the possibility of constructive, voluntary association activity aimed at the countries of the southern Rim so as to encourage strategies for conservation and protection there.

J. Bonnier reminded participants that the aim was to lay the basis for a Conference with new characteristics. It should not be a forestry or scientific congress, nor an ideological celebration ; rather, it should enable the Mediterranean peoples and their political or administrative representatives to realise just what sort of entity these natural areas and Mediterranean woodlands are, and the future of this entity in the face of the various changes presently being felt, notably :

- a change in civilisation : relations to production, to the economy and to a particular regional territory are undergoing total upheaval (economists speak of post-industrial society),
- ecological changes, with possible climatic upsets and their consequences for environments.

Mediterranean forests must not be seen simply via a more or less virtual image or representation. They are tangible entities, of living substance, material, with a past that explains a great deal, a present that is more or less happy, more or less stable, and dynamics that are sometimes contradictory or conflicting.

In M. Bariteau's view, the future Conference will have to explain why the specific ecological and social characteristics of the Mediterranean Rim merit major investment by public authorities (national and the European Union) in order to maintain woodland areas.

Guidelines for the Conference

From the various contributions, C. Bifulco and J. Bonnier identified three major themes :

- The state of ecosystems : statement of previous evolution, the duality of man's impact as destroyer of biodiversity yet agent of new variations, the intrinsic internal dynamics of a forest ecosystem.
- Species and inter-species ecological biodiversity in Mediterranean woodlands.
- The evolution of ecosystems with particular reference to human presence and change at a global level.

These themes might well be taken as sub-topics for reflection within the framework of preparation for the Conference. However, F. Romane and V. Ducoli warned against any such subdividing : biodiversity cannot be considered in the same way as the other two themes because biodiversity is a criterion for assessment and a transversal tool.



V. Ducoli proposed approaching the subject via forest management. J. Bonnier pointed out that wood production does not form part of the "Ecological Specificities" topic. On the other hand, under this heading can be grouped everything connected to the ecological consequences of human action (both destruction and protection, creation or maintaining of biodiversity...) and thus lead on to the various topics. The issue is to know how much importance to attribute to human impact.

J. Blondel proposed dividing up the overall subject on the basis of the different uses of Mediterranean woodlands and the problems and issues these uses give rise to. It would be necessary to talk about resources, heritage and problems and then draw up a list of geographical areas. The problems of Mediterranean woodlands are not the same around the northern and southern Rims ; in addition, there are particular aspects linked to coastal and peri-urban zones. He emphasised the importance of urban growth around the Mediterranean and reminded everyone that the forests cannot be thought about while civilisation is excluded.

Gérard Falconnet wondered what tools can be used that will enable us to take into account the ecological characteristics specific to the natural environments around the southern Mediterranean. How can such environments be respected ? How can they be recreated ? How can man be integrated into an ecological dynamic ?

Carlo Bifulco returned to a typology of Mediterranean woodlands, proposed by J. de Montgolfier, based on the uses made of them :

- woodlands used by a generally poor rural population,
- woodlands affected by the decline in agriculture,
- woodlands subject to the pressure of urbanisation and social demand,
- woodlands devoted to wood production.

For each of these categories, it will be necessary to assess the dynamic of biodiversity, along with the

impact of man on the evolution of the woodlands and their specific ecological characteristics. He suggested that, given a perspective for cooperation between projects for land use development and improvement (in the pilot territories), one pilot project, at least, should be set up for each category. He proposed that the forest in the Vesuvius National Park be considered for selection in the category "woodlands subject to the pressure of urbanisation and social demand".

The multifunctional character of the woodlands has frequently been mentioned. Even so, in each category there is often one predominant function. Forests with multiple uses are generally managed with a view to favouring one of the functions, sometimes to the detriment of the others. This is an important point because, in land use and development policies, it is the "prime" function alone that is likely to be taken into account.

The different guidelines proposed for directing efforts highlighted several points :

- How can ecological specificity be used as a vector for drawing attention to Mediterranean woodlands ?
- What impact has man had, and continues to have, on woodlands ? How should mutations in society be viewed ? What tools should be used if forest management is to respect the specificity of the Mediterranean environment ?
- How can the perspectives for evolution related to climate change be taken into account ?

J. Bonnier thought that it was quite possible and desirable to invite countries with a Mediterranean climate located outside the Mediterranean Rim. Nevertheless, the aim is not to organise a world congress but a conference focused on the problems and issues of the Mediterranean Rim. On the other hand, it is indispensable to widen the circle of representatives presently involved to those of other major Mediterranean forest countries such as Spain, Turkey and those of the Middle East.

CIVILISATION AND HERITAGE*

Andrée CORVOL-DESSERT**

INTRODUCTION

The aim of the "Civilisation and heritage" seminar, chaired by Andrée Corvol-Dessert, was to amplify awareness of the heritage involved in Mediterranean woodlands and to identify the constituent features of this heritage so as to extend any definition of it to include all relevant topics in the debate on forestry and the environment during the forthcoming *First Mediterranean Conference on Forests and Natural Land Areas*.

The first part of the discussion dealt with the awareness of heritage as evidenced by such aspects as :

- the evolution in legislation and the attitudes of different population groups vis-à-vis forests,
- the defence of woodland heritage throughout history,
- the place and status of woodland in land use and development policies.

The recognition that conflicts have arisen from the use or occupation of Mediterranean woodlands and from the attitudes to the woodland heritage of those involved led the participants to a second phase in which they :

- considered how woodland heritage is perceived and what are the historical and cultural determinants shaping the perception of woodland heritage around the Mediterranean Rim,
- reflected on the idea of heritage : what defines Mediterranean woodlands and what do they encompass in terms of landscape, backdrop, protection or conservation, diversity and biodiversity ?

MEDITERRANEAN WOODLANDS AND THE IDEA OF AWARENESS OF HERITAGE

General evolution of Mediterranean woodlands

Contributions from A. Corvol-Dessert, Jacqueline Dumoulin, Cristina Montiel and Frédéric Fresquet showed that the state of the woodlands as well as their function have undergone a fairly similar evolution in the south of France (Provence and the Midi) and in Spain (the Valencia region). A contribution from H'maïed Kouki on Tunisia made evident a parallel with the countries of North Africa.

Evolution of Mediterranean woodlands in southern Europe

The woodlands of agrarian societies

A. Corvol-Dessert explained that up to the middle of the 19th century, woodlands formed an integral part of an agri-silvi-pastoral system¹ in which they played a role in production in agriculture (grazing land, source of bedding) and in craft and industrial activity (building, tools, firewood, hunting and gathering).

Forests had a vital economic role even when the inhabitants had no real appreciation of their value as heritage. Fire, which in agri-silvi-pastoral systems generates regrowth at the same time as it cleans, was seen as a necessary, but sometimes fearsome, evil which could be kept in hand because the population understood how to control it and live along with it.

* Workshop held on the 8th March 2001 in Aix-en-Provence (France).

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¹ As further reading, see : *Cahier d'études n°11 "Forêt, environnement et société"* presented by A. Corvol-Dessert, 2001, edited by the *Institut d'histoire moderne et contemporaine* (CNRS), on the topic "Forests and livestock".

The population explosion and over-exploitation of woodlands

French forests were described by J. Dumoulin as being in a deplorable state right from the start of the 19th century. In the middle of the same century, rural population reached its greatest density which resulted in excessive use of farmland. Total area under woodland declined rapidly : in France, it fell between 1760 and 1827 from 14 million hectares to 6,5 million. The situation in Mediterranean woodlands was particularly catastrophic and contemporary descriptions by writers, botanists and foresters, which were very pessimistic, were confirmed by data gathered in the field. The ecological consequences, made worse by the remorseless Mediterranean climate and the violence of the rainstorms, were sorely felt : flooding, changes in the direction of water courses, erosion from runoff, drying up of springs...

According to Mauro Agnoletti, the growth in population in Italy in the 19th century (nearly 75 % over the century) led to a big drop in the area under forest (-22 % between 1870 and 1914). The development of agriculture, particularly in the mountainous zones, not only reduced woodland area through pasturing and field clearance but also altered the structure of the forests (an increase in coppicing at the cost of standard tree cover).

There emerged an awareness of the fragility of these areas and recognition of a need to protect them at the same time as marginally agricultural land became subject to numerous vested interests. The state, which up till then had shown little interest in natural Mediterranean land areas, sought to exercise control over them, opposing the demands of forestry professionals and contesting customary local practices. Thus began an era of increasing conflict focused on Mediterranean woodland areas.

Disappearance of the rural population and renewed extension of woodlands

Towards the end of the 19th century (or the middle of the 20th in certain countries like Spain) such conflicts died down because the issue of excessive cultivation, as opposed to protection, disappeared along with the rural population then leaving the land. Abandoned agricultural land reverted to natural woodland which thus again increased in extent.

This departure of the rural inhabitants brought with it a loss of understanding and know-how in forest-based activity and fire came to be seen more and more as a catastrophic phenomenon beyond control. Progressively, woodlands became the preoccupation of city dwellers and tourists, of an urban elite operating via the state and voluntary organisations.

Evolution of the woodlands in North Africa, notably in Tunisia

According to H. Kouki, the area under woodlands in Tunisia slowly decreased over 2,000 years from 3 million hectares to 1,5 million at the end of the 19th century. The main causes were felling for boatbuilding (particularly during the Carthaginian period), pastoral nomadism and domestic uses. At the end of the 19th century, as in Europe, the speed of decrease accelerated and went on until the middle of the 20th century. In two hundred years, the area under woodlands fell by 90 % to a mere 360,000 hectares in 1956.

The first legislation concerning woodlands appeared in 1936.

With the second half of the 20th century, the tendency was reversed. The situation in Tunisia has been very different from that in Europe because today nearly 1 million people (out of a total population of 9 million) inhabit woodland areas. On the other hand, domestic uses have shrunk considerably as firewood is no longer used as much and wooden objects have been replaced by plastic or ceramic ones. At present, woodlands cover 900,000 hectares and they are spreading regularly. Tunisian woodlands comprise naturally-occurring residual forest and recently afforested zones.

The evolution in Algeria and in Morocco has been similar to that in Tunisia.

As Jean Bonnier has pointed out, the varying evolution of Mediterranean woodlands reflects their extreme sensitivity to outside pressures (whether these result in an increase or a decrease in woodland area). It is necessary, however, to bear in mind the difference in the concept of duration as seen by a forestry professional or a historian. A coherent usage of the term needs to be established and adhered to in the course of debate.

THE EMERGENCE DURING THE 19TH CENTURY OF AN AWARENESS OF HERITAGE

The evolution in legislation and the attitude of local inhabitants

In their contributions, J. Dumoulin and F. Fresquet described the conflicts that arose with the active involvement of the state in natural land areas, to a similar degree in both Provence (S.-E. France) and the Midi (S.-Central France).

The 19th century in France was a period of transition



during which the national government, along with forestry professionals, adopted a new interventionist approach which was manifested at the national level by a clear awareness of the value of woodland as heritage. At the same time, this state intervention and the limiting of certain practices had the effect of making local populations and those responsible for woodland management aware of the economic value of the forest with the result that they, too, sought to assert their control over the woodlands.

Introducing legislation for municipalities with woodland in Provence

As J. Dumoulin explained, the Forestry Régime (the legal framework governing woodland matters) ensured better protection for woodlands. However, article 90 of the French Forestry Code, which applied to all woodland municipalities, laid down criteria for access to the Forestry Régime which were difficult to apply in Provence on account of the region's specific ecological features and its silvipastoral system.

In 1828, all municipalities whose woodlands were already subject to the forestry régime were asked whether they wished to continue under the régime or preferred free administrative status. In the three *départements* of the Var, Vaucluse and Bouches-du-Rhône, a majority (from 57 % to 77 %) of the municipalities opted for free administration, thus indicating their refusal of centralised state control.

Even so, when woodlands were classified as apt for development or use, the municipalities could not do just what they chose : preservation orders were made and customary local practices restricted. The local authorities complained on numerous occasions and some concessions were granted, for example for grazing, which was recognised in its specifically Mediterranean form. The forestry administration nevertheless always maintained strict control over the situation. On the other hand, the local authorities never conceded an inch on matters of hunting : the central government was not able to impose concessionary rights on hunting in municipal woodlands.

Eventually, the central forestry administration managed to introduce regulations into forestry practice but only with difficulty and, above all, with the help of the socio-economic climate (exodus of the rural population, strong competition among livestock raisers) which gave the central authority the upper hand in many situations (notably with respect to grazing rights).

Woodland protection and the struggle for power in the Midi (s.-w. France)

F. Fresquet has similarly demonstrated that, in the Midi, state interventionism and the restriction of customary local rights resulted in even more conflict than in Provence. There were violent demonstrations, sometimes armed, forest wardens were murdered, stands clear-cut and even municipal revolt (as in the "War of the Demoiselles"). The forestry administration had to ask for state help and, indeed, the army was called in.

"Defending woodlands" took on an occupation-expropriation cast involving land use issues, rather than leaning towards preservation or conservation.

Eventually, as happened in Provence, the departure of the rural population accompanied the end of conflict and left the field vacant for the forestry professionals to take over and impose their forms of management. Only much later did they allow access once again to farmers and the general public, but then stipulating the conditions for such access.

Awareness of heritage and the respective roles of the state and the municipal authorities

In both Provence and the Midi, it proved difficult to set up forestry regulations and protection. In J. Dumoulin's view, it was these regulations, combined with the disappearance of the rural population, that ensured the survival and the development of the woodland heritage in the Mediterranean region. She underlined the beneficial effects of inclusion under the Forestry Régime : despite the fact that in 1930 Mediterranean forests had still not recovered the form they had in the mid-18th century, in the Var *département*, between 1830 and 1879, there was an increase in acreage of 177 % in municipally-held woodlands.

Such data might lead us to think that an awareness of woodland heritage existed only at the national level, while resident populations and their local authorities still behaved in an unreflecting manner. Such an image of local irresponsibility prevailing in the rural communities was to be reinforced at the end of the 19th century by problems of flooding and erosion that affected urban areas and, as Pierre Dérioiz has pointed out, helped push the city-based élite into backing the central state authorities.

A. Corvol-Dessert reminded participants that some municipalities which had retained freely administered

woodlands (outside the Forestry Régime) managed their woodlands very well (the forest at Bédoin in the Vaucluse, certain forests on the Mont Aigoual). She supposes that local authorities managed their woodland heritage quite well up to the beginning of the 19th century. Subsequently, the density of rural population and the pressure from agriculture grew so great that the prevailing systems were upset. The reactions caused by central government intervention betray, if not a demand for local autonomy, at least the attachment felt by the local inhabitants for their woodlands and, thus, show an awareness, if not of their value as heritage, at least of their place in the local economy.

According to F. Fresquet, the conflicts that arose reveal a battle between two antagonistic types of land use pattern : that of forestry management based on northern European models, centred on the tree ; and that of a peasant economy integrated into an agri-silvi-pastoral system.

The role of voluntary organisations and the feeling for nature conservancy

Georges Aillaud remarked on the importance of a feeling for nature in the emergence in the 20th century of an awareness of woodland heritage. Coming out of the Romantic movement, this sentiment was rapidly fostered by the creation of associations for nature conservancy and the protection of sites. Thus, in Marseille in 1906, the local residents demonstrated against the opening of quarries in the coastal hills of the Calanques.

The people involved were a social élite with influence on the way people thought and they played a major role in the emergence of an awareness of natural heritage. The taking into account of Mediterranean forests can also be linked to the Provençal renaissance and the Felibrige cultural movement : woodlands were now seen as part of Provençal heritage, highlighted by the rise of regionalist movements.

C. Montiel underlined the role of voluntary associations in Spain where militant groups played a vital role at the time of the sale of government-held property. Such associations have continued in existence down to the present.

J. Bonnier noted the considerable ambiguity latent in what has been, or is being, said by various nature conservancy groups in some Mediterranean countries. Such groups, if not branches of northern European associations, were and are often strongly influenced by them. Yet the dominant British/German/Scandinavian line of reasoning neglects the specifically

Mediterranean dimension and thus ends up out of step with the issues confronting Mediterranean woodlands. P. Dério pointed out that, even so, there are examples of strictly local associations such as the Catalanian Excursionists.

THE PLACE OF MEDITERRANEAN WOODLANDS IN CONTEMPORARY SOCIETY AND ITS PERCEIVED VALUE AS HERITAGE

Dispossessing the local population and authorities

C. Montiel, when describing the socio-economic evolution of the forests in the Valencia region in Spain, stressed the phenomenon of dispossession, followed by a lapse into the tertiary sector, that has affected Mediterranean woodlands since the middle of the 20th century.

In an initial phase, the departure of the rural population and the relinquishing of land led to an extension of the area under woodland. This spread went along with the abandonment of farmland and thus, also, of agricultural methods (for example, the controlled use of fire).

To what extent has greater professional forester involvement reinforced the phenomenon of dispossession ? In F. Fresquet's opinion, the greater strictness of regulations allied to the resulting confrontations have hindered the continuation of certain peasant practices that might have helped in tackling contemporary problems (the use and control of fire in combatting fire, or grazing in woodlands which, when widely and suitably maintained, could well have provided an alternative for livestock fodder during recent crisis periods).

The abandonment of woodland areas by the rural population is a social phenomenon whose implications go well beyond the antagonism of forester and farmer.

On this point, A. Corvol-Dessert remarked that during reforestation work undertaken after the departure of rural inhabitants, forestry professionals lamented the lack of available workers.

P. Dério thought that the involvement of government forestry personnel had restricted the involvement of people from other non-peasant horizons.

J. Bonnier reminded participants that in France at the moment, the French Forestry Commission (ONF) manages only publicly-owned woodlands which, in the Mediterranean regions, represents 30 % of woodland

area. A major proportion of forests is unmanaged because the local peasant communities have all but withdrawn from involvement with them. This situation is, at one and the same time, a problem of disinheritance of land and a dismissal of the heritage value of woodlands.

The slide of Mediterranean woodlands into the tertiary sector and an assessment of its value

C. Montiel explained that with the decline of the rural population, woodlands have lost their primary function of production and have slipped over to the tertiary sector (tourism and a role in the landscape). The result has been a drop in the economic value of woodlands and a fall in the price of land classed within a woodland zone but unqualified for a building permit.

The value of woodlands is no longer linked to any concrete production. It provides a number of services to urban populations. There is a problem of assessing the worth of such services and, thus, of the value of the woodlands themselves. Their value could well justify the costs linked to woodland upkeep and protection. Jacques de Lustrac suggested that the *First Mediterranean Conference on Forests and Natural Land Areas* should result in the creation of a "Mediterranean woodlands" economic sector grouping all the products deriving from the various types of use. Of course, it remains difficult to evaluate the function of Mediterranean woodlands (in the northern part of the Rim) related to the quality of life they engender or to a region's attractiveness for tourism.

Américo Carvalho Mendes stated on this question that considerable research is being conducted in assessing the overall value of woodlands, taking into account all these aspects. Publication of this work is planned.

Nevertheless, P. Dério reiterated that on the question of the value of Mediterranean woodlands, various situations occur. Though heritage management often involves making a loss, a forest of holm oak which provides firewood is profitable because the operating costs are low.

Present-day difficulties politicians face concerning Mediterranean woodlands

Speaking as an elected member of both local and regional government councils, J. de Lustrac wished to underline the difficulties politicians face when making

decisions in this field on account of the conflicting pressures that exist related to the numerous issues involved.

The elected representative is responsible for the management of collectively held areas, via their use and development. Moreover, his or her decisions have to be justified in relation to a budget. Thus, the lack of direct cost-effectiveness of Mediterranean woodlands poses a problem.

Mediterranean woodlands are subject to conflicting interests with :

- on the one hand, forest landowners who do not make profitable use of their holdings and are confronted with the low value of their land,
- on the other hand, users who are attached to their woodlands and demand protective measures for them, sometimes antagonistically as in the case of hunters and walkers.

Such disagreements generate conflicts which, though less violent than in the 19th century, may still sometimes result in deliberately-set wildfire as a means of freeing plots from compulsory regulatory constraints. An awareness of the heritage value of woodlands and the demands of society concerning natural areas are not always compatible with some people's economic interests or with the development plans of others. The elected politician has to reconcile interests that are sometimes opposed.

The difficulties may be worsened by a gap between the technical and political meaning of language. For example, as Mohamed Larbi Chakroun remarked, there is an important difference in the notion of the term Mediterranean woodlands. For the technician, any natural area, whether wooded or not, constitutes a part of the forest area because it harbours traces of the earlier presence of woodland or it offers potential for development as forest. The evolution of woodlands thus corresponds to a modification in the tree cover. Such a definition accepts that Mediterranean woodlands can change their appearance without changing their vocation. From a politician's standpoint, only those areas under trees would tend to be considered as woodlands.

DEFENCE OF WOODLAND HERITAGE AGAINST WILDFIRE

The attitudes of different people to the protection of woodland areas and to the methods deployed to fight fire reveal the contradictory perceptions that society has of its forests.

Attitudes and behaviour in relation to wildfire

A reading of the police statements reporting fires and their attendant damage between 1920-1960 reveals the (lack of) importance of woodland heritage in the eyes of society at large. Christine Bouisset cites the case of fires burning up to 150 hectares (some 375 acres) yet declared as having caused "no damage" because they did not affect either dwellings, farmland or productive forests. In such cases, non-productive woodlands were not seen as constituting part of the woodland heritage.

J. Dumoulin put a rider on this observation by pointing out that a law was voted in 1870 that implied the creation of firebreaks and works designed to limit wildfire. However, such measures were only implemented in renowned symbolic areas such as the Maures and the Esterel mountains (*département* of the Var).

At the beginning of the 20th century, according to C. Bouisset, there was a divergence between what was officially said by forestry management ("all fires must be put out") and what their local agents thought (they adopted a more pragmatic approach). From 1930 onwards, as public authorities acquired more say, a systematic anti-wildfire programme was established which involved the local inhabitants as well as improved adaptation of woodlands. Priorities in any fight against wildfire remained clear : first, the protection of people, then of property and, finally, of the woodland heritage.

The organisation of firefighting aimed at limiting the risks deriving from woodland heritage rather than at risks likely to endanger it. Indeed, there existed an evident gap between the localisation of forests and the localisation of protective measures and equipment : woodlands near urban centres were the object of great attention whereas the hinterland was neglected.

The protection of woodland heritage depends on the value attributed to it and this varies according to its nearness to a town or to the emblematic character of the site.

The status of fire and its use

The displacement of Mediterranean woodlands into the tertiary sector, allied to the departure of the rural population, has led to the criminalisation of fire. Also, the threat from wildfire has increased with the closing in of the plant cover and the abandonment of silvipastoral techniques and controlled fire methods.

The more the woodlands spread and grow wild, the more wildfire becomes dangerous and out of control.

Carlo Bifulco restated that fire is nevertheless an integral part of Mediterranean ecosystems. The patchwork landscapes in which woodlands alternate with farmland means a limitation to the spread of woodlands.

Recourse to fire is at present the subject of polemical debate. P. Dérioz had firsthand experience of differing points of view on the occasion of a seminar on Mediterranean mountains devoted to burning stubble or fallow and forest fires. Among firemen, there is opposition between the dominant view held by the fire service at the level of *départements* (sub-regional governments), which favours using water, and the old-time traditional practices of some municipal corps of volunteer fire brigades, many of whom were farmers, and for whom controlled burning was a firefighting technique.

The second of these approaches is the longest standing. It is akin to agricultural methods still widely used at the beginning of the 20th century. The rural community, including foresters, believed that fire had a regenerating effect and that as long as it burned at a distance from fine stands of trees it posed no problem. Now, however, with the closing over of the cover, its use has become dangerous.

As G. Aillaud has also pointed out, fire is used to maintain open cover and thus helps to safeguard certain species.

The use of fire as a tool to combat wildfire has re-emerged in the debate on wildfire. People have begun to wonder about the effect on soil of sea salt (dropped from Canadair airplanes). J. Bonnier warns forcefully about the possible harm from the "let it burn" school of thought now emerging. It is not a matter of knowing whether the principle is good or not; what is to be avoided is adopting an extreme position just like the "no fire" view.

Polemic on the means to be used in fire prevention

Should the emphasis in defending woodlands against wildfire be on fighting fires (developing protective measures and the means to fight a fire) or on long-term prevention ?

C. Bifulco, C. Bouisset and C. Montiel highlighted the failure of land use and town planning programmes to take into account woodlands and the risk of wildfire.

J. de Lustrac stated that numerous measures have been taken for the prevention of wildfire. Three quarters of the funding given to the Provence-Alpes-Côte

d'Azur Region for woodland development and management come under the heading of forest fire prevention (fire breaks, clearing undergrowth...). He also pointed out that the idea that "woodlands don't vote" is false because very powerful pressure groups have their lobby.

The polemic is about the meaning of the term prevention. Technicians consider that prevention implies maintaining open cover and landscapes, taking into account their evolution over the long term, as well as integrating the risk of wildfire into land use and development programmes. On the other hand, elected politicians often view prevention as undertaking useful action to modify the situation case by case.

THE PERCEPTION OF MEDITERRANEAN WOODLAND HERITAGE AS SHOWN BY SOME EXAMPLES

Woodland heritage on the southern Rim of the Mediterranean

Land ownership

H. Kouki and M.L. Chakroun, through their description of the status of woodlands in Tunisia and by comparing it to that in other countries around the southern Rim, made clear the relationship of inhabitants to their woodlands and also showed how the role played by the administration in Muslim countries reflects their history and civilisation.

In Tunisia, up to the 18th century, woodlands and grazing areas were considered to belong collectively to the rural villages. During the 18th century, they became the property of the Regent in Tunis but remained unequivocally available for use by the local population according to customary rights. At the end of the 19th century, the woodlands came increasingly under centralised government control but customary rights were respected. This is still the prevailing situation and it gives rise to conflict. The population living within the woodlands, now owned by the state, make ever-increasing demands (for firewood...). Privately-owned woodlands do exist but occupy a small area : of the 850,000 hectares of woodland that come under the Forestry Régime, only 50,000 belong to private owners. Most of such forest is made up of stands recently planted for economic or political reasons (projects for job creation, private initiatives to ensure land does not get taken over in collectivised schemes...).

The situation is more or less the same in Algeria and Morocco. State-owned forest represents 90 % of total woodland area throughout North Africa. In Syria and the Lebanon, private property represents a bigger share of land though the basic pattern of ownership is the same. In Libya and Egypt, there are only very small areas of woodland.

Unsuitable management models

According to M.L. Chakroun, in Tunisia the absence of title deeds and the scattered nature of holdings make it difficult to identify private landowners.

The management of commonly-owned heritage could be a justification for public authorities to become involved with private holdings. A. Corvol-Dessert suggested a realignment of land ownership patterns on the model of the French *remembrement* schemes (based on voluntary plot exchange programmes).

Generally speaking, there is a divergence between the dominant approaches to forest management (based on northern European models) and the specific features, both ecological and social, inherent in the Mediterranean context. M.L. Chakroun explained how, in Tunisia, reforestation was long thought of as depriving the local inhabitants of good agricultural land. Thus, the professional foresters, trained in Europe and for whom forests had the single function of saw wood production, found themselves in conflict with the local population.

F. Fresquet recalled that in France, when the Forestry School in Nîmes² (southern France) proposed different models for silviculture, it was very strongly disapproved of by the powers that be, including the leading Forestry School in Nancy (northern France).

More recently, efforts have been made to take into account the resident users of woodlands. M.L. Chakroun thought that in terms of managing such areas with a view to profitable exploitation, their specifically Mediterranean characteristics must be born in mind, especially their multi-purpose use (wood, aromatic plants, honey...).

Cypriot Woodlands

In Cyprus, the perception of woodland heritage is related to history. Karios Nektarios explained that the

² Unlike the ENGREF (National School for Rural Engineering, Water and Forestry), the "Nîmes School" was a very lively school of thought active at the end of the 19th and beginning of the 20th centuries. Its main figures were Flahault, Fabre, Nègre.

island has been occupied successively by different cultures whose influence must be taken into account. The current forest cover is in a highly deteriorated condition as the result of age-old intensive human activity, notably in agriculture.

Forests and other woodlands cover some 385,400 hectares (47 % of the island). 40 % of the forests are state-owned. Privately-owned woodlands are small and their owners do very little with them. The state-owned areas are formed mainly of natural stands and national parks, with a small amount of forest given over to timber production. Wildfire is seen as the worst factor in the deterioration of the woodlands and this fact accounts for protective measures being the main aspect of woodland improvement initiatives. Cultural and heritage factors are taken into account when drafting land use plans.

Typology of landowners, management and users of Mediterranean woodlands in France

As a means to better understanding the perception of the Mediterranean woodland heritage in France, P. Dérioiz has drawn up a typology of the different kinds of people involved and the types of land holdings.

It can be said there are two broad categories of woodland :

- publicly-owned : by the state, municipalities and, more recently, by *départements* (a *département* is France's basic administrative unit),
- privately owned : essentially held by rural families. The importance of these holders is declining, mainly because of :
 - ♦ the disappearance of the rural population and the breaking up of holdings through the inheritance laws (which often results in "unconscious ownership" on the part of the inheritors),
 - ♦ the sale of plots, in the first instance to institutional investors, then the sale of land to accompany house sales to city dwellers moving to the country or buying holiday homes.

As to the people involved who affect the woodlands, they are :

- those engaged in silvicultural management and who actually intervene in the forest : National Forestry Commission personnel (in state woodlands and in some municipal holdings) and big

landholders,

- contractors who come in to fell the trees and contribute to opening up the forests to other users (by making hauling tracks...),
- those involved in fire protection and fighting (Agricultural and Fire Services, employees of the *départements* and municipalities...) who keep access tracks open throughout the forests,
- livestock farmers who use woodland grazing and help in upkeep.

Other modifications (for tourism, hunting...) are much less common and as yet hardly impinge on woodland profiles.

Among users, there are those whose activity implies a degree of woodland dynamics (active landowners, livestock farmers...) and those who, on the contrary, expect a certain fixity in the woodlands and the landscape (leisure users).

Even though woodlands often give the impression of being left to themselves, users and owners almost always move in somehow. Conflicts always crop up between the various types of people involved : some are longstanding but are now disappearing (as between shepherds and the Forestry Service administration) whereas others are emerging more strongly (hunters or shepherds on one side, leisure users or ecologists on the other).

P. Dérioiz insisted on the wide variety of woodlands whose differences derive from their management, their uses and their natural, cultural or historical heritage.

According to M. Agnoletti, in Italy the landholding pattern has an effect on the feasibility of carrying out forestry policy. 60 % of woodlands are in private hands, 5 % belong to the state and 35 % to local authorities. The central government has little direct control over forest resources. Furthermore, 74 % of holdings are less than 2 hectares in area, which is to say they are too small to justify investment or to generate good returns on forestry activity.

THE IDEA OF WOODLAND HERITAGE

Definitions of heritage

The idea of heritage, according to P. Dérioiz, presupposes :

- the existence of a possession with a recognised value, either economic or for some other use,
- the existence of a possession that is maintained and enhanced in its function,
- the concept of ownership.

In this definition are implicit the notions of something fixed (through the preservation-conservation aspect) and something dynamic (via management and exploiting development potential).

The idea of woodland heritage, in A. Corvol-Dessert's view, includes several aspects that will vary from one period to another depending on the object in question. Initially, the idea of heritage was basically spatial, such that defending heritage meant defending a particular territory. Then the idea was enriched through the accretion of a forest element. Nowadays, such heritage involves landscape which must satisfy certain aesthetic criteria. At the present time, the notion of biological heritage is coming to the fore.

C. Bifulco pointed out that the term heritage contains the idea of transmission to future generations. In Italian, the expression "forest" seems originally to have meant "something surrounding the town" (in Italian, *forestiere* means stranger). The present situation seems to be the opposite: urban communities surround the woodlands. Despite the fact that the lessening of pressures from agriculture has led to an extension of forest in the mountains, the lowland plains are increasingly urbanised. The forest no longer seems to be strange and limitless; it is now a part of society and it must be preserved.

The cultural and landscape aspect of woodland heritage

M. Agnoletti remarked on the absence in most theoretical studies on forests of any consideration of the cultural environment and landscape in which they are situated. Yet the value as heritage of Mediterranean woodlands is related to these aspects. In general, a region's heritage plays a significant economic and psychological role through its impact on landscape and its cultural importance. By way of example, a study of wine drinkers choosing Tuscan wines revealed that for 60 % of them the governing factor in their choice was linked to the area's culture and landscape, not to the quality of the wine.

An awareness of the history and cultural environment of Mediterranean woodlands is necessary in order to understand and appreciate them as heritage. A given territory offers different possibilities whose emergence depends on the social group that occupies it. The value of a given landscape can vary according to time and place : in Italy, sweet chestnut forests occupy a very important place in some local heritage whereas in other locations, at higher altitude where such forests cover extensive tracts, they attract little attention. Values change, depending on the cultural context. As a result, the choice of which species or landscape to conserve is

not a foregone conclusion.

Roland Courtot wondered how, within the assessment of the value of woodland heritage, the architectural and historical heritage present in the woodlands can be suitably taken into account.

C. Bifulco insisted on the double-barrelled nature of woodland heritage, at the same time material and intangible, and also stressed that choices have to be made between the various roles expected of woodlands.

On this question, G. Aillaud noted the evolution of the idea of heritage as seen through changes in how woodland heritage is protected : the earliest measures aimed at saving forests from destruction (fire breaks, access tracks...). Now, such features are criticised because they have a negative effect on landscape or on a forest's wholeness as an entity (as it exists in people's fancy!). The value of the woodlands' contribution to the landscape is now taken into account.

G. Aillaud showed the evolution of Mediterranean landscape in paintings. He noted a change not only in the woodlands themselves but in how they have been represented in the light of social demand and artistic trends. It seems clear that a society's scale of values is projected into an idealised image of forests.

PROBLEMS RELATED TO THE PROTECTION AND CONSERVATION OF HERITAGE

Relations between man and nature

Every social group projects onto the forest its subconscious desires and images. A. Corvol-Dessert reminded participants that the myth of an earthly paradise is strongly rooted in western societies. The search for this idealised woodland wilderness frequently leads to a consideration of the relations between man and nature. Is the aim of protecting heritage to subtract nature from human action ?

In P. Dério's view, the essential divergence in the approach to the relations between man and nature is whether man is to be considered as within nature, a part of it, or outside it.

The description of woodlands in Muslim countries showed the great extent of recent replanting. A. Corvol-Dessert wondered what value such new stands have for the population. Do people see them as "natural" in the way that, along the northern Rim, many forests are felt

to be natural even when such forests have in fact been planted ?

The relation between man and nature remains ambiguous, especially where Mediterranean woodlands are involved (as G. Benoit de Coignac claims, "Mediterranean forests have never existed without a human presence."). Discourse about protecting natural heritage often takes up the myth of nature as untouched and wild, whereas Mediterranean forests can be claimed never to have been free from human intervention.

Such ambiguities underlie the doubts people have about the motivations and criteria that underlie choices for protecting the woodland heritage.

From the idea of protecting woodland heritage to the idea of prevention

A. Corvol-Dessert wondered if national parks could be considered as the quintessential example of heritage protection in so far as they remove nature from human effects, thus enabling it to be protected and conserved.

This question raises two others : are conservation and a fixed state for heritage feasible ? Does the protection of heritage necessarily imply a fixed, invariable stasis ?

Mummifying a landscape to preserve it does seem to be utopian because, like every biological system, landscape ages and so cannot be kept invariable without outside intervention.

P. Dério explained that managing heritage means to guide its evolution and conservation. Yet the idea of landscape as heritage is indissociable from the desire to preserve it intact. Here are two contradictory positions. G. Aillaud felt that landscape as heritage is like freezing the frame on one image.

There is a nuance between the ideas of protection and conservation. Protection assumes action against external pressures that could lead to the degrading or disappearance of the protected natural area. Conservation, on the other hand, can at times lead to human intervention to prevent the biological evolution naturally inherent in the given natural area.

M. Agnoletti explained that conservation can be linked to restrictive measures but also to measures for encouragement, as in agriculture (farm grants, agri-environmental measures...). In this view, conservation would no longer be seen as a drive towards fixity but understood, rather, as linked to upkeep and management. It could thus involve enhancing the quality of a

region and its products.

Decisions about conserving or protecting landscape will thus be taken in terms of the cultural, social and environmental context. At the moment, two criteria predominate in matters affecting heritage : variety of landscape and biodiversity.

Ideas of landscape variety and biodiversity

Landscape diversity

Diversity of landscape is, of course, connected to landscape as heritage. Thus, M. Agnoletti pointed out that the diversity of landscape in Tuscany has dwindled by 60 % since the 19th century. The conservation of landscape heritage aims to maintain a variety in different areas so as to ensure diversity of landscape.

A. Corvol-Dessert noted that favouring diversity in landscape is an entirely societal choice : at the beginning of the 20th century, it was just the opposite that caught the imagination, with vast monotonous expanses (deserts, tracts of forest in Siberia...).

P. Dério made clear that two kinds of diversity need to be distinguished : the internal variations within a landscape (that is to say the patchwork appearance of a landscape, manifesting different uses) and a diversity of landscapes across a region. The value of a particular landscape is related to the role it plays in the diversity of its environment.

Biodiversity

Nowadays, the notion of biodiversity is implicitly included in the idea of woodland heritage. Much emphasis is placed on the perils now threatening such biodiversity. J. Bonnier expressed a degree of scepticism about this viewpoint. It can be admitted that at an early time the over-exploitation of forests might have led to a reduction of biodiversity but, at present, the opposite pertains (under-use and return to a wild state). Yet the discourse remains the same.

All matters relating to biodiversity should, however, be considered in relation to the scale of the context that pertains in each case and the potential for adaptation of the various organisms involved.

G. Benoit de Coignac also pointed out that when woodlands are involved, considerations of biodiversity are often reduced to the higher plant and animal species, to the detriment of lower plant species and the microfauna.

According to P. Dério, biodiversity is assessed at a given point in time as a function of certain ecological equilibria and a society's outlook. Thus, certain species will be reintroduced rather than others.

H. Kouki cited the case in Tunisia of the reintroduction of species now become ill-adapted to the prevailing social and environmental conditions and which, on this account, could not be released into the wild. This example raises the issue of whether maintaining biodiversity is natural or artificial and if there is any advantage in such reintroductions.

C. Montiel observed that contradictions exist between discourse on maintaining biodiversity and reforestation policy in areas that already have woodlands or agri-silvi-pastoral activity and display rich biodiversity. She wondered about the coherence among the various heritage-inspired approaches and undertakings. This issue was here being considered from the point of view of biological and landscape heritage; but it has implications for issues linked to vested interests and use of woodlands.

CONCLUSION

The debate highlighted some specific features of Mediterranean woodland heritage and gave definition to the idea.

A. Carvalho Mendes reiterated that there is no one single kind of Mediterranean woodland heritage but

several types and such diversity constitutes, at one and the same time, the richness but, also, one specific characteristic of Mediterranean woodlands. This diversity is also manifested in terms of landscape, management, the people involved and the uses made of the woodlands.

Mediterranean woodlands, the object of assorted vested interests and projections, are at the same time subject to numerous contradictions. The protection of forest heritage simultaneously raises ideas of defence concerning the woodland heritage, forest management and the preservation of landscapes. These different notions will acquire varying degrees of importance according to their environmental, social, historical and cultural contexts.

During this seminar many questions were raised for discussion and major issues brought to the fore. What remains to be done now is to clearly identify any matters still missing from the agenda, identify people who can serve as a resource and decide on which issues should be pursued further in the context of the forthcoming *First Mediterranean Conference on Forests and Natural Land Areas*.

SOCIETIES, TERRITORIES, INSTITUTIONS*

Américo CARVALHO MENDES**

INTRODUCTION

The International Association of Mediterranean Forests has been given responsibility for carrying out the sub-programme "The Problem of the Mediterranean Forest" within the framework of the Interreg IIC programme .

This project, through the seminars it will hold on particular topics, aims to highlight those aspects involving natural woodland areas that must be developed if such areas are to be better integrated into policies for land use and development.

The brief of the "Societies, Territories, Institutions" work group was to establish which socio-economic themes and which geographical areas fundamental to production systems should be studied in greater depth at the *First Mediterranean Conference on Forests and Natural Land Areas*. However, given the necessary involvement of an institution representing a territory in that territory's operations, a second objective emerged, seeking to propose an organisational framework for the Conference which will enable a large number of institutions and territorial entities concerned with Mediterranean woodlands to take part.

During the meeting reported on here, the following points were considered :

- the necessity for a Mediterranean conference on forests,
- the agenda for the work group "Societies, Territories, Institutions",
- the preparation of the International Association for Mediterranean Forests' Interreg IIIB project.

* Workshop held on the 15th-16th December 2000 in Torre del Greco (Italy).

** Professor at the Portuguese Catholic University of Porto (Portugal), leader of this work group.

DISCUSSION ABOUT THE FIRST CONFERENCE ON MEDITERRANEAN FORESTS AND NATURAL LAND AREAS

The need for a meeting place at which to exchange knowledge

One of the main characteristics of Mediterranean woodlands is that they provide society with a multiplicity of goods and services. In contrast to non-Mediterranean forests, the main part of their productivity is related to non-ligneous products and to non-commercial aspects such as leisure activities, landscape, tourism and forming a backdrop to general life. In the final analysis, only a small part of their importance involves wood production.

In this context, it is quite obvious that the different socio-professional groups involved with Mediterranean forests are cut off from each other in their work. The Mediterranean is an area where there is a need to create links between communities of interest which function differently (scientific, political, professional, non-profitmaking and NGO) and do not communicate sufficiently with each other. Bridging the gaps between these sectors is essential if the areas we are concerned with are to be better taken into account in land use and development policy. At the moment, people designing projects and those with decision-making power rarely have the opportunity to dialogue.

The IAFM, with absolutely no ambition to dominant or prevail, offers itself as a forum for such dialogue, particularly within the context of the *First Conference on Mediterranean Forests and Natural Land Areas*. The Conference will be the first occasion on such a scale to take into account in a global way all aspects of society involving Mediterranean woodland areas.

It will not be a "classic" meeting, exclusively of scientists, technologists or professionals, nor an official

gathering of politicians and civil service administrators or an informal citizens' assembly. Rather, it should be a conference where scientists, technologists, industry professionals, politicians and citizens will all be... not just welcome, but really essential.

The IAMF has instigated this collective undertaking as a forum for exchange. It should continue after the Conference by fostering broader and more significant work.

How to set up such a meeting place ?

Once we have established the necessity for a forum of interdisciplinary and interprofessional meeting and exchange, we can tackle the issue of what mechanisms might be required to facilitate and organise such dialogue.

First of all, it will be necessary to identify all the constituent parties at ground level (notably, representatives of the farming community, of rural populations, of woodland owners, of silviculturalists...) and to make sure they are represented as well as possible. What must be avoided is a sector by sector approach to the question of land use. There must be a totally integrated approach to the problem.

In order to avoid the Conference becoming "stand-ard", with a succession of individual papers and little dialogue of an interdisciplinary or interprofessional nature, we need to come up with a new procedural method. Such a wide-open approach is not without risk. Good organisation is indispensable to avoid conflictual situations arising from the encounter of people with divergent opinions and interests.

How to make sure the Conference's recommendations are effectively carried out and widely publicised

There is many a conference whose recommendations are not carried out. How can we ensure that recommendations issuing from our Conference get put into effect ?

To this end, our documents must be available to everyone. Then we need to use all suitable means of communication to promote our final document. The press¹ and other forms of social communication must

¹ See the work reported by the "Training, Research, Raising Public Awareness" workshop.

be kept informed in order that most of the general public can be kept up to date on our work. The political fraternity, too, including elected local and regional officeholders, needs to be made more aware of our work.

The adoption of our resolutions by official authorities capable of influencing those with the power to determine the future of Mediterranean forests will ensure our message gets wide and effective coverage. As of today, we need to do everything we can to gain the widest acceptance and recognition of our Conference, making the event resound like "the clang of a bell" to rescue Mediterranean woodlands from the general public indifference that is now smothering them.

Aims and organisation of the Conference

We seek to bring about a design for the occupancy of Mediterranean woodlands that will be adapted to their specific characteristics and, at the same time, take into account the new opportunities and constraints they are faced with. To this end, all the various people involved must consider every way of enhancing the usefulness and value of these areas. This model for land use planning will differ from the model based on area specialisation which is frequently used north of the Mediterranean region (in northern regions, zones of agricultural production are separate from those of industrial activity, residential sectors are separate from natural areas).

It is for this reason that the Conference should :

- give an account of experiments in cooperative action already underway in areas just learning about management. What difficulties have been encountered ? Have solutions been found ? How can the systems be improved ? What has been suggested ?
 - highlight the different kinds of woodland management in different countries. Are there similarities ? Might cooperation be possible ?
 - contribute to developing cooperation :
 - ♦ between the different decision-making levels of government (intergovernmental, inter-regional and inter-municipal cooperation),
 - ♦ between non-elected bodies (woodland owners associations, environmental associations, local development bodies...)
 - ♦ between researchers and industry professionals,
- ...and facilitate improved coordination (backing for research, recommendations to elected offi-



cial) in the field of management of rural areas. What can be done to bolster this approach (the Territorial Contract for Use (CTE), current in France, is an example of an attempt at another way of administering and managing rural territory) ?

The Conference should enable us to shape a collectively agreed strategy leading to development activity. The Conference will be structured around the following axes of approach or poles :

- a political pole, with proposals for strategies and measures essential for the development of Mediterranean forests, taking into account their characteristics,
- a professional and scientific pole, with "workshop" discussions on specific major issues identified during the Conference's preparatory phase and included on the order paper,
- a pole for the exchange of experience in development action, grouping the submissions and reports concerning field projects aimed at promoting the multiple values of Mediterranean woodlands and natural land areas,
- an activities aspect, to ensure that the Conference, while highlighting and furthering the worth of Mediterranean woodlands, will also be an enjoyable occasion for participants.

The political aspect

The political aspect of the Conference might take the form of an assembly at which participants can discuss a resolution forming the basis of an International Agreement on forests and natural land areas. This resolution would be submitted to the Ministerial Conference on the Protection of Forests in Europe, to the governments of Mediterranean countries not belonging to this Conference, to inter-regional and inter-municipal collaborative bodies, as well as to NGO's.

This resolution could be drafted on the basis of the preparatory documents discussed prior to the First Conference. International meetings concerning forests may also provide an opportunity that should not be overlooked for developing the resolution. Its final draft could then be enriched and finalised at the First Conference.

The aim of the resolution would be to widen participation in decision-making processes concerning Mediterranean woodlands, but without any pretension to displacing government authorities.

The professional and scientific pole in the socio-economic sector

The professional and scientific pole at the Conference will consist of workshops which will serve as a forum for discussion of the technical work related to the major topics that have vital importance for Mediterranean forests in the socio-economic field. This pole will function with a view to ensuring effective and wider cooperation on the topics concerned after the Conference is over. It is also conceived as a way to bring to the attention of a wider audience the work done and the debates conducted by the different work groups during the preparatory phase.

The socio-economic and territorial administrative themes that emerged during discussion between the work group participants, and which will be dealt with within the framework of this pole, constitute so many different but complementary aspects of the great ecological, economic and sociological diversity of Mediterranean woodlands whose wide multifunctionality is their overall unifying characteristic. The five themes proposed as a focus for work are :

- an inventory of the goods and services, both commercial and non-commercial, found in Mediterranean woodlands, and the highlighting of their specific features as compared to those found in other types of forest,
- an analysis of approaches based on territory (these differ from an approach by sector of activity or from models of area specialisation) which integrate the implications of such areas for scientific research, professional activity and political action related to Mediterranean woodlands,
- an analysis of Mediterranean woodlands as social entities undergoing transformation, each with its own history at the interface of society and the natural environment,
- an analysis of the mechanisms, both natural and socio-economic, that underlie the risks threatening Mediterranean woodlands (wildfire, climate changes, pressure from urbanisation, agricultural uses, desertification...), along with the policies and patterns of behaviour which worsen or attenuate the consequences of such risks,
- a technical and economic assessment in the field, of the pilot projects which, it is hoped, will reveal for these Mediterranean areas new perspectives for development within the present-day context of radically changing societies.

THE PROGRAMME OF THE WORK GROUP "SOCIETIES, TERRITORIES, INSTITUTIONS"

Contribution to the preparation of a resolution on the International Agreement on Mediterranean Forests and Natural Land Areas

The work group aims, through its contributions to various other conferences, to facilitate the inclusion of Mediterranean forests on the agendas of international meetings on forests. To this end, it is important that the Conference adopt a resolution that will foster more active and effective cooperation between all partners involved with Mediterranean woodlands. Such an engagement could take the form of the "international agreement"² mentioned in the previous section above.

To help this process along, the work group adopted a two-stage approach :

- the first was to take advantage of the Silva Mediterranea meeting, held in Egypt, to submit our point of view concerning the future of this institution³. This committee of the FAO is undergoing a crisis that will probably generate discussion of its reform at this meeting. The contribution of the IAMF to this debate will be a first test of the Association's ability to influence the aspect of international policy on Mediterranean forests. A first draft of the stance of the IAMF will be discussed at its AGM to be held on 9 March, 2001. This draft will then circulate among the work groups before a final version is adopted⁴.
- if this first stage is successful, the second stage will be the preparation by the work groups and the Executive Council of the IAMF of a draft for a resolution to submit to the Conference. This resolution, referring to an international agreement, would include the following ideas :
 - ♦ the importance of a territorial approach,
 - ♦ a Mediterranean model for the management and land use of the territories,

² As a follow-up to such an agreement, it will be necessary to set up a secretariat capable of running the cooperative undertakings (research networks, inter-regional cooperative undertakings, cooperation between NGO's...), the meetings of public authorities (inter-ministerial and inter-regional conferences) or independent bodies/people from public life.

³ At the present time, this institution is the only one of an inter-governmental nature that encompasses the totality of Mediterranean woodlands.

⁴ This has in fact taken place and the IAMF (both its Executive Council and the Annual General Meeting) has decided that if the FAO so desires, the Association will be happy to contribute in whatever way, making suggestions for the reform of Silva Mediterranea.

- ♦ the need to consider the forests in interaction and at the interface with :
 - the protection of natural resources,
 - local communities that live in them (society),
 - the environment.

This resolution should integrate the topics and discussions that will have featured in the work of the groups, work constituting the preparatory phase of the Conference.

The IAMF could also make itself heard at the group of the Intergovernmental Forest Forum of Low Forest Cover Countries (LFCC) whose secretariat is in Iran. It might also do so at events related to the International Mountain Year to take place in 2002.

Contributing to the development of partnerships between bodies conducting socio-economic research and NGO's

Within the framework of this work group, advantage could be taken of the preparatory stage of the Conference in order to identify partnerships that already exist, or may be envisaged, between bodies conducting socio-economic research and NGO'S. The Conference hopes to provide a meeting place for the exchange of experience but, also, to reinforce cooperation between all people involved with Mediterranean forests, without in any way attempting to duplicate or replace networks or stakeholders already present.

The regional centre of the European Forestry Institute (EFI), based at Solsona (Spain), represents an important partner for cooperation in this field of research. In the short term, two initiatives of this network could be of use in preparing the Conference :

- work done on inventory and putting a figure on the evaluation of the total economic value of woodland in the different Mediterranean countries ;
- a IUFRO/EFI seminar on the risk economy that threatens the forests (June 2001), during which our Association has been invited to present its project for a Conference.

Reference was made, also, to the following networks and initiatives :

- projects within the framework of the ICAMAS, particularly the MAI projects at Chania concerning a network of observatories in the eastern Mediterranean based on remote detection and GIS. The MAI centre at Chania is



involved in a "forest fire-GIS" project and is studying the effects of wildfire,

- an Interreg programme, partnering the Apulia region (Italy) and Albania, for the study of regional computerised systems and research on forest typology,
- wildfire study projects under way in Croatia,
- the CEMAGREF (France) wildfire studies,
- a network of agri-forestry, led by Christian Dupraz (INRA, France).

The participants in the work group session were invited to spread information and write articles presenting these projects and networks (along with others that have not been cited). Such articles could be published in the IAMF Information Bulletin.

Some participants underlined the fact that there is no list of all the forest-related organisations presently functioning. There is an FAO department working with NGO's in the agricultural sector⁵.

The representatives of the Associação terras de dentro (Portugal) and the Tunisian Association of Forestry Technicians have proposed working together on a survey of NGO's whose work touches on Mediterranean woodlands in order to know their characteristics and their projects, with a view to shared initiatives. The study will result in a document on "development models for Mediterranean ecosystems". A follow-up workshop might be held to refine the document.

PREPARING THE IAMF PROJECT WITHIN THE INTERREG IIIB FRAMEWORK : WHERE SHOULD THE PILOT SITES BE ?

Between now and April 2001, regions wishing to participate in the Interreg IIIB programme must submit their projects. The IAMF project within the framework of the Interreg IIC programme – "The Problem of Mediterranean Forests" – has been well received because it has adopted a "from bottom up" approach. Within the framework of Interreg IIIB, the possibility has been envisaged of starting up pilot projects, giving consideration to regional policies⁶, in which forest matters form an integral part and in which exchanges of technicians will take place. We need to identify the points where we can usefully intervene. Which regions are candidates in this programme ?

Examples of pilot projects cited include :

- the cork oak (Carolina Varela is responsible for the Silva Mediterranea cork oak network ; the Algarve region (Portugal), in cooperation with the Andalusia Region (Spain) and the Douro and Alentejo Regions (Portugal), will be responsible for management of, and research on, cork oak in mountainous regions where the slope can create production difficulties),
- nature reserves,
- Mediterranean forests in mountainous regions (Jean-Paul Chassany is leading a research project on sweet chestnut forests). In France, agricultural decline is less marked in these areas than in coastal hill country,
- wildfire (more rational undergrowth management by grazing ; silviculture as a fire prevention technique...),
- the problem of abandoned farmland, the decline and abandonment of woodland,
- the Natura 2000 sites in Italy (Bioitalia),
- tertiary uses of Mediterranean woodland. This vital aspect could be improved thanks to exchange of knowledge and skills and could be better integrated into overall management plans,
- problems arising from small forest holdings or from residents living in forests but considered undesirable,
- monitoring the evolution of regions and landscape (Umbria, Italy).

Topics for debate :

- non-wood commercial production with high added value, such as cork : the Montado project (Portugal), conducted by the Associação terras de dentro (Alentejo-Portugal) in partnership with local development associations in Spain and Italy,
- management of areas subject to environmental constraints : the Vesuvius National Park (Italy),
- the problem of land ownership,
- management of areas subject to forest wildfire.

Post-Conference activity should give rise to establishing the foundations for a network of observatories for Mediterranean woodlands, centred on their biological and socio-economic aspects.

⁵ The delegate from Silva Mediterranea indicated that he could supply the addresses of NGO's in Turkey and Lebanon.

⁶ The issue remains about the role of public policy in the dynamics of Mediterranean woodlands.

RISKS THREATENING MEDITERRANEAN FORESTS AND NATURAL LAND AREAS AND THE ROLE OF WOODLANDS IN RISK PREVENTION*

Ricardo VELEZ MUÑOZ**

INTRODUCTION

The seminar "Risks Threatening Mediterranean Forests and Natural Land Areas and the Role of Woodlands in Risk Prevention" was under the chairmanship of Javier Gómez Martín, Director-general of forest resources for the *Consellería de medio ambiente* of the Valencian Regional Council.

Its aim was to identify the main hindrances and obstacles hampering the identification and prevention of risks related to Mediterranean woodlands.

In his exposé on the major problems highlighted by the Valencia Region's Forest Land Use and Development Plan, Javier Gómez Martín explained that certain of the functions and aspects of the woodland areas were presently on the decline (logging, grazing) whereas others had appeared and were gaining importance. Thus, the role of woodland in the renewal of aquifers was increasingly taken into account, as were the indirect benefits related to landscape, protection against erosion... New activities had also sprung up in connection with leisure activities (hiking, outdoor pursuits...) or wind farms.

In the Valencia region, woodlands cover half of the surface area and are made up of numerous species. The weak points of these woodlands are :

- low profitability and the almost total lack of direct benefits,
- poor involvement of owners in managing these woodlands,
- the large number of municipalities without woodlands.

Forests nevertheless arouse public interest.

Mohamed Larbi Chakroun emphasised that the points preoccupying Javier Gómez Martín in the Valencia region were of concern around the whole of the Mediterranean Rim.

The evolution of the woodlands depends on the kinds of use, exploitation and occupation of the land. To enable woodland areas to enjoy a positive evolution, both in quality and in area, we need to know what risks threaten them.

GENERAL PERSPECTIVE ON RISK AND MEDITERRANEAN FORESTS

The topic of risk offers two facets for discussion : it concerns the risks that threaten Mediterranean woodland and, at the same time, the role forests can play in preventing or diminishing risks.

R. Velez made clear the particular aim of the seminar which was to appreciate the full range of risks, along with their degree of importance and their interaction. As a start, he felt it important to underline a number of points as a means of giving a framework to debate.

What, in terms of forest, is a risk ?

What are we talking about : about a risk to woodlands seen as an ecological system or about a risk for society ? Risk is generally thought about from an ego-centric point of view : it is only when we are directly concerned that we see it as such. It is therefore important to consider the interaction between man and nature in order to better understand the risks that implicate

* Workshop held on 8th-9th June 2001 in Valencia (Spain).

** Head of the Wildfire Protection Service of the Spanish General Service for the Protection of Nature (Madrid, Spain), leader of this work group.

woodland.

To what extent is wildfire a danger ? To what degree can it be beneficial ? Such questions raise the problem of the use of fire, its risks and usefulness, and even its beauty.

The notion of catastrophe is intimately bound up with the notion of risk. But catastrophe can also evoke mutation or innovation. Thus, the ecological catastrophe that led to the disappearance of the dinosaurs also led to the emergence of humankind. Negative or positive are arbitrary concepts.

What has been the evolution of risk over the last fifty years ?

Our knowledge and understanding of risks are very recent. The period of time during which risks have evolved has been very short. Can one nevertheless observe notable changes over the last fifty years ? What information is available ? Is it possible to design models using current data on which to base forecasts ?

Can the Mediterranean be considered separately from the rest of the planet ?

The Mediterranean region possesses specific features that must be taken into account, especially when talking about risk. But the Mediterranean Rim is also confronted by problems that are worldwide, problems influencing its own evolution and in relation to which the Mediterranean may have a role to play. Global warming, for instance, needs to be tackled globally.

How aware are we of problems that are planetary in their scope and what knowledge do we have of them on a global scale ?

What is our perception of risk ? Has it changed over the last fifty years ?

In Spain at the beginning of the 20th century, the risk of wildfire was thought of as non-existent whereas now it is held to be a major risk. Flooding produces terrible catastrophe but the existence of this risk is quickly forgotten, to judge by the increase of building in floodable areas. Pests are thought of by city dwellers as harmful. Whether there is a real perception of the risk of pollution to woodlands also remains an open question.

These points illustrate the way an outlook differs markedly depending on the risks involved. Do such perceptions depend on the context, on attempts to raise public awareness or on the real gravity of the risk ? How do the different risks objectively evolve ?

What has been the influence of the media and environmental education policies ?

Have the media enabled public opinion to evolve towards a recognition of the environment's significance or have they merely served to disclose its existence ?

The efforts made in environmental education bear witness to a new awareness of problems to do with the environment. Does such sensitivity extend to forests ? Possibly woodlands need to be integrated into a broader context to ensure they get taken properly into account.

Does awareness about the environment include the problem of woodlands ?

The preoccupations of politicians reflect public opinion ; they have come to include environmental problems. Even so, is there evidence of increased resources made available for woodlands ? Does this preoccupation with the environment result in environmental problems being more effectively integrated into land use and development policies ?

Are the risks around the Mediterranean Rim all the same ?

In terms of risks and, thus, of forest-related problems, is there a difference between the north (Europe), the south (Africa) and the east (Middle East) ? In Europe, at present, the major problem for woodland management and risk prevention is the abandonment of agricultural land. Is this problem seen as a current or future threat along the southern Rim ?



How much attention do international bodies give to Mediterranean problems ?

During the last World Forestry Congresses in Paris and Antalya, Mediterranean woodlands were hardly even touched upon. Moreover, the FAO has considerably reduced its activities related to Mediterranean woodlands, conducted through its *Silva Mediterranea* committee.

Within the ongoing context of globalisation, international organisations are concentrating on the planet as a whole. But priority is usually given to regions such as Asia where the situation appears to be much worse than around the Mediterranean. Mediterranean problems nevertheless need to be dealt with.

The role of the IAMF is, among others, to bring to general attention the importance of the Mediterranean region along with the risks inherent in Mediterranean woodlands.

WILDFIRE RISK

The evolution of the wildfire risk

Gavriil Xanthopoulos gave a brief rundown of the evolution of wildfire risk in European society generally.

Role and status of wildfire

In earlier times, fire was not thought of as an element that might destroy the ecosystem.

Wildfire cannot be eliminated because it is present as a naturally occurring phenomenon in most woodland ecosystems. In particular, it leads to the renovation of forest cover. This role, and its importance, are especially notable in the Mediterranean area.

The evolution of wildfire risk in 20th century Europe

Up to World War 2, and sometimes rather later, local inhabitants used fire knowingly. There was an equilibrium between agricultural land and forest areas. Utilisation of the woodlands limited the propagation of wildfire.

Occasionally a major fire got out of control. There was little that could be done since firefighting tech-

niques were little developed. The main thrust of efforts was towards prevention, particularly of deliberately set fires.

After WW2, the problem of wildfire grew, even though at the same time firefighting techniques were improving.

This evolution took place at the same time as the rural population was leaving the land throughout Europe. The abandoned fields reverted to woodlands, resulting in a closing up of ground cover which was favourable to wildfire. The exodus of the rural population led to a decline in the upkeep of the areas under woodland, with a concomitant increase in biomass.

At the present time, a phenomenon of "rurbanisation", even of unplanned construction in rural areas, is creating new problems : the likelihood of the outbreak of wildfire is increasing and the consequences can be more serious (destruction of dwellings...).

Comparison with the situation in North Africa

In Morocco fire does not seem to be a threat, even though the plant formations and their associated species are very similar to those in the south of Spain, for example, and are just as inflammable.

R. Velez expressed surprise that, in general, there were no major problems with wildfire in North Africa despite the much less effective firefighting means available compared to Europe.

Mustapha El Haddad explained that the risk is limited by the very presence and activity of man inside the forest. Livestock rearing facilitates the control of inflammable plant cover. Removal of wood tends to reduce the biomass (something that raises other problems because the biomass provides a protective covering over the soil). Finally, whenever a wildfire does break out, the local inhabitants, because they are nearby, can intervene very quickly. They are all the more quick to do so because the forests constitute an essential part of their rural economy. Furthermore, there are no clear limits traced (particularly in the north) between state-owned land and private property.

The human component in the notion of risk or vulnerability

Jean-Pierre Gautier underlined the difference between human presence in the woodlands of Morocco and such presence in the forests, or on their edges, in France and Spain. The rural population in Morocco is

accustomed to the use of fire and is able to manage it. Fire is involved in their management of the woodlands and its very use limits the risk of wildfire. In France or Spain, the population of areas dominated by woodland is really urban ; the people are strangers to forest management and the controlled use of fire. The presence of these rural residents increases not only the risk of wildfire but the vulnerability of the sector (since people and their possessions have to be protected).

Fire is a hazard that must be considered in the context of the local framework whenever the aim is to assess the vulnerability of a zone and the degree of risk present. Thus, risk of wildfire increases in a given place when plant cover increases. However, the seriousness of this risk depends on the sector's vulnerability, which is a function of the locality's critical features (human presence, dwellings, areas of economic development...), along with the inhabitants' capacity to react and the means available to actually combat the fire. All these factors taken together enable an acceptable level of risk to be decided on and policies for firefighting and prevention to be carried out.

Cristina Montiel observed that risk is formed of both a physical and a human facet. Should fire be considered a risk when its control is beyond us or when the damage may be great ?

She remarked that our attitude to wildfire has changed. Is this change related to new behaviour in the face of risk or to a change in the nature of the situation and the damage caused by fire ? The diversity of situations increases the complexity of the problem : the present-day situation prevailing to the north of the Mediterranean may one day exist along the southern Rim but no one can predict this for sure. It must not be forgotten that man is a component part of an ecosystem and his actions have effects, both direct and indirect, on it.

The consequences of wildfire

Wildfire, a social problem

Luis Velasco explained that wildfire was above all a social problem : woodlands have a role in leisure pursuits and as scenery (particularly for holiday homes) that wildfire abruptly abolishes.

Maurizio Fraissinet noted the value to tourism of woodland landscapes. A wildfire, by destroying the tourist image of a region, can cause a big drop in income.

Jean Bonnier emphasised the value of these points which together could bring about a scale of criteria for assessing the seriousness of a risk. Thus, the danger-

ousness of wildfire might be analysed in relation to the harm it does to the functions of woodlands, especially those newer ones connected to leisure life and residential context.

M. El Haddad pointed out that wildfire in North Africa is less spectacular and more limited than in Europe, but poses just as much a social problem. In fact, the local populations need their woodlands. The disappearance of a forest, even of a small area, can mean a fall in income.

The impact of wildfire on the risks of flooding and erosion

According to Antoine Hurand, plant cover around the northern Rim can grow back within two or three years, thus limiting the threat from flooding and erosion. If there is flooding, before this period is over, the damage can be considerable and the eventual regrowth much more doubtful or difficult.

The frequency of wildfire, as mentioned by G. Xanthopoulos, is also an aggravating factor which can affect the dynamics of the vegetation. Similarly, grazing after a wildfire hinders the regrowth of plant cover and often modifies its structure.

M. El Haddad explained that in Morocco there are both physical and social constraints that make the re-establishment of post-fire vegetation more difficult. The disappearance of plant cover after wildfire favours erosion and a trend to desert. Here, then, the situation is just as serious as on the northern Rim, though the surface area involved is less.

Combatting and preventing wildfire

Limits to the fight against wildfire

J. Bonnier noted an evolution in the discourse about fire. Over the last twenty years, the dominant approach concerning wildfire has been "no fires". Nowadays, fire is recognised as being a part of an ecosystem and so it may be best not to put it out systematically. Bonnier fears that a "let it burn" line, just as extremist as its predecessor, is taking hold and leading to a fatalistic attitude.

L. Velasco reminded us that the crux of wildfire policy centred for a long time on the technical means to fight fire. This tactic showed its limitations when particularly violent fires occurred, such as those in the Valencia region in 1993 and '94. The strong winds in

this region sometimes make it very difficult to overcome wildfire. Furthermore, available means for fire-fighting are always inadequate when there are simultaneous outbreaks of wildfire.

Santi Lleonart Vidal estimates that 99 % of fires can be put out. 1 % will always remain impossible to extinguish. In G. Xanthopoulos's view, it would be better to reduce this threshold to 95 % : to achieve 99 % would require keeping disproportionately massive means available. There will always be a level of wildfire against which we will remain powerless.

Reflections on forestry management for preventing wildfire

Setting up a forest firefighters corps in Catalonia

Prevention starts with silviculture which has often been lacking since the rural population started to abandon the land. Santi Lleonart Vidal pointed out that the idea of protection against wildfire has evolved : no longer do we attempt to avoid wildfire at all costs; rather, we seek to control outbreaks.

To this end, the Catalonia Region has chosen to set up a forest firefighters corps. This unit of firemen, who fight wildfire during the summer period, set fires during the winter as a preventive method. This practice enables them to develop a mastery in the deliberate use of counter-fires.

R. Velez noted that, in most regions of Spain, it is the forest firefighter brigades organised by the Forestry and Environmental Services, who are given responsibility for prevention and combating wildfire. What makes them different from urban fire brigades is their specialisation : they only fight forest fires, using above all "non-water" methods : hand tools, fire to widen defensive cuts, counter-fires.

Urban brigades take over responsibility in areas where urbanisation predominates, such as around Madrid, in Catalonia and Valencia. But, increasingly, they have recourse to "non-water" techniques.

Tanker trucks and Canadair planes remain vital tools as back up to the brigades.

The problem of allocating tasks and responsibilities

G. Xanthopoulos wondered if the Catalonia Region would not do better to reinforce its forestry administration rather than set up a specialised unit within the fire-

fighting force. In his view, the activities of these firemen could better be described as protection (establishing fire breaks...) rather than prevention, which involves a policy of silvicultural management. There is a similar tendency in Greece where the firefighting budget for firemen has tripled in three years. Yet during the same period, the forestry service suffered from budget cuts.

G. Xanthopoulos, without wishing to systematically condemn the idea of transferring responsibility from the forestry service to civil defence units, considers that such a policy gives rise to conflict between organisations whereas they should, in fact, be encouraged to cooperate as much as possible. He gave as an example the American Agency for Cooperation which, in the event of a problem occurring, can mobilise all the people involved. L. Velasco suggested, in particular, mobilising extra forces (army, military police) to ensure heightened surveillance during high-risk periods.

S. Lleonart Vidal underlined that the real advantage in the creation of a special firefighters corps was their specialised training in mastering fire. The American Agency for Cooperation is but one other means which in itself does not solve the basic problem : this remains forestry management.

The human aspect in fire prevention

M. Fraissinet raised the problem of criminal fires. Fire is a longstanding instrument of threat or vengeance. In 1993, quite a number of national parks were created in Italy. There was an increase in outbreaks of wildfire as a reaction against their establishment. Spain, too, has also experienced this problem, as R. Velez reminded the participants.

Outbreaks of wildfire can be accidental, often the result of negligence. For this reason it is important to raise the level of public awareness.

In M.L. Chakroun's opinion, the solution resides in the degree of interest shown in forests. An increase would in turn justify allocating means for protection and prevention. If the population is aware of the value of its woodlands, this should lead to prevention policies.

Jorge Suarte stressed that voluntary activities can enhance contacts between city dwellers and the rural and forest-based population, leading to a heightened awareness of the problems confronting woodlands.

In C. Montiel's view, society has evolved to such an extent that it is no longer possible to distinguish two separate worlds, the urban and the rural. Nowadays, society is made up of people who live in cities and

towns most of the year but who go to the country on weekends or at holidaytime. Given that the aim is to design a forestry management programme or policy for raising public awareness, we cannot extrapolate on the basis of the political situation thirty years ago. We must adapt to socio-political models that are current now.

On the subject of forestry management, Maria Victoria Fernandez de Cordova pointed out that in the Valencia Region, 60 % of the area under forest is in private hands. It is thus essential to be in contact with the owners, ensuring that they have the financial means and the necessary scientific knowledge and that qualified technical people are available to them.

Combating and preventing wildfire

In former times, the biomass was utilised by hunters, shepherds and the rural population who together also ensured its minimal upkeep. According to Ramón Montoya, administrative services must now choose between taking over this role or seeing the forests evolve without human intervention, with the risk of seeing it change radically and unpredictably.

L. Velasco does not think it possible to design a silvicultural policy for general application. He has in mind the problems arising from fire breaks : these facilitate the structuring of woodlands but their installation provokes violent reaction in the public at large. He considers that the time has come to take stock of what has been done to date, so as to decide on what we can continue to do.

The issue of wildfire interconnects with that of woodland use and development. M.L. Chakroun pointed out the need to devise a forestry policy in order to have integrated use and development. He raised the particular problem of piecemeal ownership of forest land which hampers overall zonal management. He suggested regulatory measures to ease this problem.

J. Bonnier hoped that there may be a statement of what we can expect from woodlands in order to establish a forestry policy that will take into account presentday requirements yet also offer a perspective for the longer term. "Tell us what you want from your woodlands and we will tell you what to do about wildfire."

Managing wildfire risk at international and interregional levels

The European Union's slight regard for the specific features of Mediterranean forests

Wildfire seems to be badly understood in non-Mediterranean countries for two reasons :

- the ecological and climatic conditions which render the problem so serious are specific to the Mediterranean region. G. Xanthopoulos recalls the general surprise he aroused on this subject during a meeting in Finland in 1995.
- Mediterranean woodlands do not produce enough timber to enjoy credibility at a European level; so the means available for their management and protection remain insufficient.

R. Velez pointed out that European legislation on wildfire is inadequate. At present, there are only regulations on fire prevention and these cease to be valid in 2001. As yet, there is no talk of prolonging their effect.

He suggests canvassing the EU to obtain the necessary funding but also to launch reflection and debate on EU forestry policy and its consequences for Mediterranean woodlands.

The need for a Mediterranean policy

In G. Xanthopoulos's view, non-Mediterranean people may well fail to appreciate the actual nature of Mediterranean woodlands. So it behoves the governments of Mediterranean countries to take action.

M. Fraissinet agrees that a Mediterranean forestry policy is needed because northern forests are not concerned by the problem of wildfire. He also observed that the seasonal nature of the wildfire risk limits politically-motivated awareness to the summer only. Thus, it is difficult to establish long-term plans.

J-P. Gautier stressed the advantages of decentralised regional policymaking in the northern part of the Rim as an antidote to the predominance of northern European models for forestry management.

Organising mutual assistance

Bilateral agreements already exist between Mediterranean countries for mutual assistance in the event of wildfire. R. Velez explained that because the high risk periods around the Mediterranean Rim occur

simultaneously, this mutual assistance is difficult to put into effect. It would be a wise move to foster concerted interministerial efforts to draw up protocols facilitating such cooperation.

THE RISKS FROM EROSION

The problem of erosion in Mediterranean regions

M. El Haddad reminded participants that soil erosion may be due to both water and wind at the same time. Around the Mediterranean, erosion by water mainly affects mountain areas.

The phenomenon of erosion involves at one and the same time technical, environmental, economic and social aspects due to climatic, geological and human factors.

In Morocco, the gravity of the problem is linked to :

- the friable nature of the soils,
- a subtropical location characterised by two contrasting seasons,
- the steep relief of the mountain ranges,
- intense human activity.

M.L. Chakroun noted that, in general, the Mediterranean region is marked by a climate and rainfall patterns that favour erosion. The ecosystems are more or less adapted to such conditions. Land clearance for farming, as well as the pressure of population, have led to imbalance that has induced the dynamics of erosion.

Around the northern Rim, industrialisation and the abandonment of the countryside have resulted little by little in a reversal of the situation : with the encroachment of vegetation, problems may still exist but they are no longer as bad as at the end of the 19th and the start of the 20th centuries. Around the southern Rim, however, erosion is a major problem linked to grazing and the over-exploitation of woodlands.

The Valencia region is affected by the problem of erosion. Juan Uriol Batuecas explained that this is due first of all to the effects of wildfire and the violence of the rains.

G. Xanthopoulos observed that in Greece the causes are both chronic (over-grazing and over-exploitation) and accidental (floods, wildfire). He stressed the links that exists between these various risks and their strong interaction. He mentioned the negative consequences of the European policy of livestock grants for goats and sheep : Crete was densely wooded in the 1920's but now the soil is totally bare on account of overgrazing

and excessive wood cutting (charcoal...).

The implications of the fight against erosion

M. El Haddad pointed out that the consequences of erosion in Morocco were both ecological (extension of desert and sanding up, drop in soil fertility) and technical (sedimentation in dams and reduction in water reservoir capacity). In the end, this threatens both water resources and the availability of productive area. As of 2005, Morocco will belong to the group of countries suffering from chronic water shortage.

J-P. Gautier talked about the long-term consequences and, also, the large-scale implications of erosion, especially the role of erosion or non-erosion in relation to deltas (receding delta in the Camargue (southern France) due to lack of aggregation ; the opposite in the Po river plain (Italy)). The risk of erosion is seen differently depending on the issue considered : whether the protection of goods and people (flooding, landslides) or the long-term evolution of whole zones or resources.

As in the case of wildfire, J. Bonnier warned against being too pessimistic in approach and repeated that Mediterranean woodlands have a natural capacity to regenerate themselves after catastrophes once free from the pressure of human activity. He considers that the real problem is political : erosion is only a problem when people are involved. Moreover, in most cases when people are not involved, nature takes over again and erosion-related phenomena disappear. The question is, therefore, what policy to adopt in relation to the resident population.

In North Africa, this question raises a real political issue detailed by M. El Haddad : maintaining occupation by the rural population is a political choice aimed at avoiding the abandonment of rural areas and the mushrooming growth of shanty towns.

Water and soil conservation achieved through the fight against erosion is a challenge that must be met. Mediterranean woodlands are the foremost tool for protecting soil from erosion.

Erosion prevention policy and measures

Policy evolution in Morocco

M. El Haddad explained that in Morocco the fight against erosion has seen several stages. As early as 1911, statutory measures aimed at preventing erosion

regulated the use of woodlands (it was forbidden to clear land and remove standing trees). From 1951, a determined policy was instated to combat erosion and protect infrastructure. Between 1970 and 1980, comprehensive planning schemes and integrated projects were set up. A national seminar held in 1988 took stock of the situation and led to a certain number of recommendations.

Since 1990, the fight against erosion has had a new lease of life via the creation of regional drainage basin consultation services, research programmes and incentives to adopt an interdisciplinary, collaborative approach.

He nevertheless deplored the inadequacy of the means made available, given the scale of the problem.

Transfer of responsibility and types of action in the Valencia region (Spain)

J. Uriol Batuecas described the gradual assumption by the Valencia Regional Government Council of responsibility for the erosion problem. In Spain, the Service for the Restoration of Land in Mountain Areas has existed for 150 years. Thus, the fight against erosion has traditionally been in the hands of the central government. Since 1987, there has been an agreement between the Valencia Regional Council and the Spanish government for the restoration of drainage basins; it has been funded by the central government. Little by little the Valencia Regional Council has assumed a greater role and has taken over a part of the restoration work.

It is possible to classify privately-owned land as a priority zone in order to benefit from nationally-funded schemes. There exists a national plan for priority action in the restoration of drainage basins. The forestry administration of the Valencia Regional Council manages 35 % of woodland area and the funds linked to this plan are allocated to all the drainage basins in the region. Elsewhere in Spain, each catchment area or drainage basin is dealt with individually, which leads to more spectacular results.

At present, the main thrust of the measures is to establish infrastructure for protection and to build dams. Reforestation is not carried out under this plan since most of the land is privately owned.

In France, adapting the measures undertaken to suit an evolving situation

Antoine Hurand reminded participants that erosion posed major problems in France in the last century. To

combat the phenomenon, strict regulations were adopted and a land restoration service for mountainous regions was set up which replanted woodlands as a protective measure.

At present in France, erosion has not become, as it might have, a chronic problem. Erosion affects places from time to time : such sites are first treated with a view to protecting people and property, and in relation to legal liability in the event of accidents, rather than in the context of an overall anti-erosion policy (action is undertaken above all within the framework of town and country planning regulations).

J-P. Gautier pointed out that equipment for protecting people and property is often very expensive but, because it is a matter of safety, funding is fairly easy to get.

Erosion and the issues involved in land use planning

The risks of erosion and flooding and their interaction up- and downstream

The last serious flooding in Valencia was in 1957. R. Velez reminded everyone that the water level reached the first floor of the houses, causing the death of many people. This massive flooding was due to the problem of erosion upstream in the Valencia drainage basin. The management of flood risk involves effective land use and planning against erosion upstream with a concomitant protection of downstream zones against flooding.

The risk of erosion has been integrated into the overall land use plan for action combining civil engineering and forestry techniques.

The need for a comprehensive, collaborative approach

M. El Haddad once more stressed that Mediterranean ecosystems are fragile and complex. They require a comprehensive approach, particularly in land use plans for whole drainage basins. The phenomenon of erosion should be addressed in its technical, environmental, economic and social aspects. In Morocco, the problem of protecting dams increasingly takes into account the notion of sustainable development.

M.L. Chakroun pointed out the need to involve the local population in land use planning and management. To this end, it is necessary to adapt organisations and dismantle barriers to interdisciplinary action.



The importance of taking into account the risk of erosion in framing land use planning policy

Referring to the partitioning off of areas following the 1997 floods, C. Montiel highlighted the unsuitability of the work carried out when viewed in the light of the area involved (river beds too large). But the location of the centres of population conditioned the choices made. This example shows that actual physical modifications or forestry work remain insufficient. Solutions to the problem must be sought at the level of land use planning.

J. Uriol Batuecas cited the Territorial Plan for Action against the Risks of Disastrous Flooding. Its aim is to prevent building in floodable areas and to identify priority zones for intervention. This initiative, presently under discussion, is a notable step forward in the integration of the issue of erosion-flooding in land use planning and development.

Erosion and problems related to woodlands

J. Bonnier remarked once again that there is something ambivalent about the topic "woodlands and erosion". Forests are a tool against erosion yet can be themselves subject to it. As M. El Haddad expressed it, we must take advantage of the dialectic implied in "forests for protection - forests in danger".

He pointed out that it is woodland systems in their totality that must be taken into account : the role of low-canopy cover such as maquis, garrigue or matorral must not be overlooked.

A. Hurand noted the importance of the upkeep of woodlands upstream in drainage basins, along with direct on-site protection. Protective woodlands are now growing old and require special attention.

On this topic, J-P. Gautier remarked that the operational management costs subsequent to reforestation are neither thought of nor paid for by those who initiate replanting programmes. Yet forests planted for protective purposes are generally not profitable because timber production in them is not cost-effective. In M. El Haddad's view, they may not be directly profitable but they can help to increase the profitability of economic activity downstream.

R. Velez reminded participants that it is not possible to disassociate the various risks connected to woodlands. The fight against erosion is linked to the problem of wildfire. In this respect, what is needed is preventive silviculture. Such silviculture does not aim at produc-

tion but at protection from wildfire in order to avoid erosion.

J. Bonnier noted that it is relatively easy to reintroduce vegetation but in very difficult environments which include eroded soils, it is more difficult to guarantee its survival. Yet funding is most often available for reestablishing plant cover rather than for purely silvicultural work which, nevertheless, is necessary.

M.L. Chakroun remarked that, by definition, a densely planted stand excludes undergrowth and that only wise management of such forests can maintain a natural appearance.

He regretted that research was lagging behind in finding ways for the profitable use of Mediterranean species. M. El Haddad added a rider to this opinion, stating that research on trees considered to have strategic value was active.

The technical aspect and the need for the exchange of knowledge.

Technical matters

Several questions of a technical nature were raised : the slope of protective anti-erosion barriers, problems of channel dimension and flooding thresholds, or the effect of clear felling on the management of flooding from storm runoff.

On the question of clear cutting, A. Hurand explained that the polemic is first and foremost related to its impact on landscape. As to combatting erosion, all that matters is holding soil in place. It has been shown through experiments that if the stumps are left in place clear cutting has no effect on the hydrographs of flooding. Nevertheless, treeless land will be more likely to see erosion get a start.

J. Bonnier reminded participants that the technique of restoring mountain terrain straddles the borderline between forestry techniques and those of roadwork. In this respect, it would be interesting to investigate the methods used by the motorway companies which are nowadays big owners of woodlands.

Exchanging information and getting the most out of know-how

It would be a good thing if the various work carried out and its ensuing results, which are often remarkable, had a wider audience.

M. El Haddad stressed the value of the knowledge

and skills of Mediterranean peasant communities. Since such know-how is already integrated into the fabric of local social and economic life, it should be that much easier to take advantage of it.

J-P. Gautier referred to the importance of work undertaken in experimental reservoirs in the Provence-Alpes-Côte d'Azur region (south-east France). Similar work could be carried out right around the Mediterranean Rim.

M.L. Chakroun observed that we have accumulated considerable knowledge on matters relating to erosion but the information is not widely known because poorly communicated. Thought should be given to improving the means for exchanging and broadcasting information.

The importance of indicating risk

J-P. Gautier underlined the importance of signalling actual risk on maps and by the adoption of Geographical Information Systems. This would enable woodlands and the attendant risks to be assessed in relation to the problems of land use and development, pinpointing the role of tree cover, especially in combating the risk of erosion.

M. El Haddad stressed the utility of GIS in making the most of available information and getting a better understanding of risks. He reminded everyone that hands-on knowledge of an area remains indispensable, as does an awareness of the human and social aspects of risks.

Arguments in favour of political mobilisation

What role do Mediterranean woodlands play in preventing the risk of erosion ? Two themes were suggested : the relation between forests and water resources, and the importance of woodlands in limiting the spread of desert conditions.

The role of forests in the management of water resources

By limiting the erosion in a drainage basin, forests play a vital role in slowing down the sedimentation in dams and in maintaining the available capacity of reservoirs.

Woodlands also regulate the runoff of water. R. Velez illustrated this by citing the situation in Valencia which

gets 400 l/m²/yr, 100 l/m² coming from storms. Without the presence of forest, these 100 l/m² would be lost.

A. Hurand stated, however, that one cannot systematically speak of the positive effect of forests on the quantity of water. In a small drainage basin, the existence of forest limits the amount of water available upstream because the trees themselves consume water. Forests can also affect the rainfall levels, but on what scale ? This field of study is complex and one needs to be circumspect about all statements.

G. Xanthopoulos emphasised the complexity of the message : it is difficult to get across that areas under woodlands, depending on their location, must be extended or reduced to reach the same result !

In A. Hurand's view, when making promotional statements about forests it would be advisable to minimise their role as a reservoir of water. But woodlands do play two important roles in relation to the water resource : they regulate it through time and they purify it.

The threat from encroaching desert conditions

It was suggested by R. Velez that the occurrence of desert conditions, a more evocative notion than just erosion, should be included as a risk threatening Mediterranean woodlands. Encroachment of desert is a crucial problem in North Africa but also in Spain and Greece.

G. Xanthopoulos said that in Greece 13 % of land area is non-productive (mountainous zones or soil eroded through human activity). 5-6 % of such areas have become sterile over the last five years.

M.L. Chakroun made the point that the UNO definition of desert conditions is a fall in the fertility of the soil. In extreme conditions sanding-up occurs, another major problem in North Africa. It is important to mention that the Mediterranean Rim is included in the International Convention for the Fight against Desert. The IAMF is, in fact, in contact with the Convention's secretariat.

C. Montiel approved the linking of woodlands to the problem of desert conditions when done at an international level, though she remains sceptical about the use of the term for local situations in Catalonia.

J. Uriol Batuecas reminded participants that encroaching desert conditions is not an exclusively forestry issue. Mention should be made of it but we should remain well within the context of issues confronting woodlands.



RISKS FROM DISEASE AND PESTS

J. Bonnier remarked that up to now the topic "the health of woodlands" has received little attention from the IAMF or from the French association Forêt Méditerranéenne.

Given the evolution of the ideas involved in forestry management, this aspect, which for a long time was the central preoccupation of forestry professionals, now needs to be integrated into the wider context of issues encompassing forest and land use management. What, if anything, is specifically Mediterranean in pests and diseases? Is this risk evolving in a particular way? Is there a risk of epidemics? How should the risk of plant diseases be dealt with?

Referring to an inventory of the various risks connected with pests and diseases, R. Montoya analysed the evolution of, and the perspective for, the health of Mediterranean woodlands, along with the importance and specificity of the risks involved.

The different types of risk to plant health

The risks vary as a function of the behaviour and life cycles of the different pests and parasites. R. Montoya distinguished between risks from endemic species and those linked to non-endemic species.

Risks from endemic species

These risks may be ongoing and strong, as in the case of the processionary caterpillar on pine which is present from Cape Saint Vincent (Portugal) to the woodlands in Israel. This pest weakens the trees without actually killing them because the Mediterranean pines have adapted to them, whereas introduced species (for example *Pinus radiata*) fail to resist. These insects hinder the harvesting of timber and the enjoyment of leisure activities, as well as spoiling the landscape. Eduardo Perez Laorga noted the spectacular nature of attacks and the ensuing attention they get in the press, which makes them a priority for treatment.

Another caterpillar, closely related to the processionary caterpillar on pine, thrives at altitude and causes major damage in the Atlas range.

Boring insects also do considerable harm. They particularly affect managed woodlands where they first attack ailing trees or the residue from felling. They are also increasingly a concern in unmanaged woodlands where the biomass is on the increase.

Funguses may form a serious risk. A disease due to a fungus endemic in Spain has been nicknamed "the butane disease" because it has developed since gas replaced wood for heating (the dead wood is no longer collected). Dutch elm disease, present in Spain in a particularly virulent form, has resulted since the 1980's in the almost complete disappearance of the elm which is a symbolic tree in Andalusia and Castille. Another form of the disease attacks the mountain elm but here the damage is less because there is greater diversity among the stands.

These endemic risks may break out as epidemics or at a particular moment: certain weather conditions will favour a particular insect. This is notably the case with the processionary caterpillar whose zone of infestation expands during mild winters. Also, particular conditions of stress can modify the physiology of the trees, inducing a new vulnerability. Thus it was in Spain after the severe droughts in 1995, when the tops of Aleppo pines dried out on account of a fungus that was well-known in the USA but had never hitherto been encountered in Spain. It would appear that the drought caused a change in a physiological trait in the species, making it more vulnerable.

E. Perez Laorga mentioned the damage caused by a pine borer in the Valencia region (Spain) after the succession of dry periods between 1990 and 1996. Thus, the afforested pines planted in the dunes of Guadamar died in 1994. This phenomenon is all the more serious because it has affected both a linear plantation of only a small number of trees and a forest that plays a major role in the local climate.

The epidemic or cyclical attacks of some pests are totally unpredictable. R. Montoya cited the case of a lepidopteran which caused the collapse of a number of doctoral theses because its appearances and disappearances were so random that it was impossible to collect data. Yet it causes enormous damage and regularly vanishes. Similarly, a biting insect that came in numbers to Spain in 1993-94 was previously unknown there and completely disappeared in 1997.

Risks from non-endemic species

The Mediterranean region is not cut off from the rest of the world. The globalisation of trade brings with it the permanent risk of the introduction of non-endemic pests and diseases.

Thus, a nematode responsible for damage in Asia and Canada recently arrived in Portugal despite the vigilance of European agencies. Subsequent damage has been noted and even though protective measures have been taken, there exists a real danger of a spread around the whole Mediterranean Rim.

Another fungus is presently causing damage to *P. radiata*. The risk is that much more serious because the fungus is transmitted on the seeds.

We also know that some pests are present around the Mediterranean even though damage has not yet been notified.

Other pests have not yet arrived in Europe but could do so at any time. A fungus akin to the Dutch elm disease is the cause of much concern at the moment.

E. Perez Laorga mentioned damage caused by insects that live in the soil. He noted in particular the case of an insect that attacks the roots of trees in replanted woodland. In his view, such insects are not the object of enough investigation in silviculture whereas in agriculture they are the focus of much study.

Elsewhere, continuous mortality in pine forests has been recorded without there being any explanation. Replantings of Scotch pine have been decimated even though the stands were planted forty years ago.

The importance, evolution and likely development of risks to plant health in Mediterranean woodlands

Do risks to plant health show specifically Mediterranean features ?

Problems met with in a Mediterranean context also exist elsewhere. But as R. Montoya explained, some Mediterranean woodlands are more susceptible because they encounter extreme conditions.

Mediterranean woodlands are made up of species that display remarkable adaptive mechanisms (particularly in relation to drought). Other typically Mediterranean species are very fragile indeed and their reaction to drought or parasites cannot always be predicted. The example already given of the Aleppo pine in 1994 shows that extreme conditions can lead to upsets.

The importance of risks for non-endemic species

R. Montoya reminded participants that at the present time in Europe or around the Mediterranean there are insects able to infest any kind of wood. An incident at a given moment (climatic or ecological phenomenon) could thus start off an epidemic.

Furthermore, numerous insects and fungi can enter the Mediterranean region and prove to be very dangerous. Within the same ecosystem there is ongoing evolution or co-evolution of various phenomena. The arrival of an external pest can generate imbalance in the ecosystem. Such an upset will be so much more severe if the organism is cut off from its original environment and meets with no predators.

It is necessary to maintain a permanent watch for pests but, also, to improve forestry professionals' knowledge about potential pests so as to minimise eventual failures in control.

Foreseeable influence of climatic change

Insects which reach epidemic proportions take advantage of favourable climatic conditions to extend their range. Often it is the cold that limits their expansion. The forecast global warming could well lead to wider infestation by certain pests. For example, the caterpillar *Thaumetopoea pityocampa*, common on pine, could well attack firs at altitude. Such tree species, unlike the pine, have no defence mechanisms against this insect.

As a result of global warming, some risks that are typically Mediterranean could well become a problem in central Europe.

The management of plant health risks and forestry issues

The management of risks to plant health : the example of Valencia

In 1985 a transfer of responsibility took place by which the Valencia Region took over forestry management from the Spanish national government. E. Perez Laorga explained that at this period there was no forestry health service and such matters were looked after by the agricultural services. Any treatment was carried out as a farming activity : that is to say, at regular intervals and not as a function of attacks. Treatment and measures taken were not well suited to given situations.

Then, in 1996, when a restructuring took place, the forestry health service was put in the hands of the environment service. E. Perez Laorga expressed his regret that this service undertakes little silvicultural management.

Interesting initiatives have been set up. The Valencia Region has a surveillance system based on 1,600 units



of 200 hectares. Data is collected annually and six people are involved in this task. The data bank has been integrated into the Geographical Information System.

This enables zones to be selected for treatment and intervention to be suited to the actual conditions *in situ*, followed by monitoring of any evolution. In this way, optimising treatment has led to a reduction from 35,000 hectares to 17,000 hectares of areas needing treatment against the pine caterpillar *Thaumetopoea pityocampa*.

He noted, however, the difficulty encountered in the fight against the "butane gas disease" : the holm oak stands are very young and treatment difficult to carry out because there is more undergrowth than trees. The strategy at present is to not intervene, except in truffle oak plantations.

In other cases, the health service has no answer to the dying off of stone pine that has been observed over the last three years.

The problem of replanting and the introduction of species

An analysis of plant health risks has revealed that replanting raises several problems. Replanted stands are more sensitive and the introduction of new species could lead to unforeseen consequences for plant health.

M.L. Chakroun explained that on the one hand monospecific stands are especially sensitive because the lack of diversity favours the proliferation of pests ; and on the other hand, in a species' natural area damage is limited because the pests that attack a particular species are themselves the quarry of predators that regulate their numbers. The introduction of a new species is often accompanied by the species' diseases or insect pests but minus its biological regulators. In addition, when a species is faced with other conditions than the more favourable ones of its place of origin, it may have difficulty adapting or be less resistant to attacks.

R. Montoya gave the examples of the introduction of the eucalyptus and the cedar into Europe. In the beginning, there seemed to be no problems until damaging pests appeared which proliferated due to the absence of their own natural predators.

He also mentioned the virulence of the Aleppo pine caterpillar attacks in the Balearic Islands where this species has evolved in isolation. As a final instance, there is the *Pinus radiata*, introduced into the outskirts of the Aleppo pine zones : it is attacked by this same caterpillar against which it has inadequate defence responses.

It is thus vital to study the conditions for introduction of a new species and to understand its ecology.

E. Perez Laorga addressed the problem of replanting in semi-arid areas. Within the framework of the National Reforestation Plan for the 1970's, vast areas were planted with Aleppo pine. Thirty years later, these trees have only reached 4 metres in height because they have been the victims of diseases that are definitely linked to silvicultural management unsuited to the semi-arid conditions. J. Bonnier remarked on this topic that an inadequate understanding of the mycorrhization of seedlings has led to the failure of numerous replantings.

In his opinion, the era of large-scale replanting is over (except for the restoration of specific areas). At present, the priority is rather to manage existing stands.

The health risk and woodland management

E. Perez Laorga balked at the term "fight", in so far as parasites form part of an ecosystem. The idea should be not so much to fight them but to manage the overall system. What is the threshold for considering that a parasite is really damaging ? Quite so : R. Velez explained that when it is a question of combating, it is already too late : " If it's a fight you're involved in, you're already halfway to losing."

International aid (particularly from European funds) is more easily obtainable for reforestation than for management. It is therefore important to emphasize this need for managing woodlands.

Concerning plant health risks, R. Montoya wondered if the absence of silvicultural input is not the fundamental problem. The health of forests should be an essential concern of silviculture. Foresters should be familiar with and manage this risk. Health-related damage can have repercussions on the structure of stands and on operational activity.

J. Bonnier emphasised that, increasingly, environments require management. Too much emphasis has been given to the notion of the forester-planter. A forester needs to be first of all a silviculturalist and, to this end, more money needs to be put into silviculture. Also, perhaps what is needed is tree cultivation more akin to farming practices which take greater account of problems of plant health and pests.

A possible Mediterranean monitoring network

J-P. Gautier wondered if it was not a good idea to set up a Mediterranean-wide network to monitor damage.

R. Montoya pointed out that there was already a network in existence covering 35 countries, though none from the southern Rim. Several projects were under way, notably one on the pine caterpillar *Thaumetopoea pityocampa*, involving cooperation between the French INRA (national agricultural research body) and various institutes around the southern Mediterranean. It would in fact be interesting to have more comprehensive data from all round the Mediterranean Rim.

The risks related to abiotic factors

The problem of pollution in Mediterranean regions

Should pollution be considered a potential risk ?

R. Montoya explained that the atmospheric environment in which plant species live is constantly evolving. Chronic pollution could thus lead to a modification in the stomata of the leaves. A proliferation of damaging pests or an increase in the aggressiveness of certain pathogenic organisms could bring about an evolution in the habitats in which plants live. This is easy to demonstrate when it happens in the soil. Atmospheric pollution that is chronic but not severe is difficult to identify even when it has an effect on vegetation.

The problem of pollution arose after WW2 as a result of industrialisation. In the 1960's, damage was observed in woodlands near to industrial areas. Chimneys were then raised in order to disperse the smoke higher (and farther away). In Spain, pollution originating in the north-west of the country has affected the Landes area of south-west France while the pollution at Valencia has reached Corsica.

Local and occasional pollution has given way to cross-border pollution to the point that it worries those responsible for forestry. First ecological groups, then governments, have mobilised. Phenomena in northern Europe such as acid rain and expressions like "the death of the forest" have largely contributed to stirring up public awareness and concern.

Monitoring has been undertaken in woodlands throughout the whole of the EU. However, results have not shown any direct link between the state of health of the forests and the level of pollution.

Risks related to drought

Monitoring of the state of health of forests has, in contrast, highlighted the importance of drought : 20 % to 40 % of trees growing in drought-sensitive areas are in poor condition on account of drought.

The lack of moisture can weaken some trees and thus make them more sensitive to parasites.

The perspective for the evolution of drought-related risk is hard to define. R. Montoya thinks that we should consider likely changes in climate as a reality and not wait until it is too late. He suggests that a buffer strategy incorporating species and techniques adapted to the coming conditions will smooth the transition.

Monitoring scheme : setting up an observation network

Subsequent to the Geneva Conference, a plan was set up in the 1980's to monitor the state of health of European woodlands. The scheme includes shared regulations and, above all, a monitoring network recording the damage incurred as a result of atmospheric pollution.

The network is based on a European-wide grid of unit areas of 256 km² and a sampling of reference trees within each area carrying forest.

For the monitoring, simple criteria were chosen. Yearly meetings are held by the technicians and specialists involved from the various countries, in order to harmonise the data. Specific criteria were defined for Mediterranean woodlands.

R. Montoya underlined the interest of this experiment as well as the quality of the methodology. Some thirty countries make up this network. While its scale is too big to permit study of local phenomena, it does enable scientists to study the consequences of more widely spread factors such as pollution.

The same network is used in Spain to study the reaction of woodlands to drought. The methodology is different : each sample specimen is considered as the centre of a 20 km² unit in which the measurements are taken.

In France, the network has been used to observe the evolution of certain pests after the storms of 1999 and the heavy snowfalls.

This network has facilitated a better understanding of the forestry characteristics of the different countries. R. Montoya added that it would be a good thing to extend the network to include all the countries of the Mediterranean Rim.



GENERAL ISSUES

The interaction of the various risks

The review of the various risks has made clear their interaction. It can hardly be acceptable to consider each one in isolation. R. Montoya showed the link between pest attacks and the problems of drought and pollution. M. El Haddad stressed the interaction between the risks of erosion and wildfire. Perhaps we can also speak of links between pest attacks and erosion ?

Other risks threatening Mediterranean woodlands

The risks already referred to are the most significant at the present time. The list is not, however, exhaustive.

M. El Haddad mentioned the risk of the disappearance of some endemic species (fir, argan, cork oak) and the risk of genetic pollution of endemic species by imported species.

J. Bonnier raised the question of invasive plants. Should they be considered a risk ? R. Montoya thinks effectively that there is a risk in the invasion of fallow or set-aside land by nitrophytic plants : their effect is deleterious to the quality of the landscape.

In Spain, proliferation of invasive plants has been observed in national parks. Similarly, a spectacular invasion was seen in the Monte Cristo National Park in Italy.

How real is the threat here ? What are the criteria that permit a definition of a dangerous and invasive plant ?

The issue of the fragility of woodlands

M. El Haddad wondered about the coherence of statements underlining, on the one hand, the fragility of forests and, on the other, their special aptitude to react to stress and various constraints.

As R. Montoya sees the question, the term "fragile" is used by forestry professionals in a particular context. Mediterranean woodlands are fragile above all on account of the spectacular character of the damage they suffer.

But, as A. Hurand reiterated, the notion of fragility should be seen as relative to a time frame and to the dimensions of the area involved.

J. Bonnier considered that the contradiction is merely seeming. Fragility is a notion that depends on the objectives and functions that are assigned to woodlands and on the type of forest that is desired. Thus, simple vegetation cover whose role is to afford protection to a drainage basin, maquis or matorral will not be seen as fragile because it rapidly reconstitutes itself. But if one wants to maintain the long-term potential of high standard trees for their value in the landscape or for leisure, then theirs will be a fragile ecosystem because it requires such a long time to come about.

R. Montoya reminded the meeting that amongst the diversity of natural woodland areas there are certain woodland formations whose protection is absolutely essential. In his opinion, the discourse about fragility aimed at the general public should be maintained even though it may need to be relativised, depending on the environments and the tree stands involved.

R. Velez approved of the need to insist on the idea of fragility and warned against a certain manner of presenting the issue : any statement that suggests that, come what may, the evolution of woodlands is inevitable, whether good or bad, undermines the notion of risk and creates a vacuum for a fatalistic attitude just as dangerous as a catastrophe-centred discourse. "Neither fatalistic nor catastrophic" would be a suitable recommendation to sum up the stance to adopt on the risks facing Mediterranean woodlands.

The need to mobilise political forces to ensure exchange of information

R. Velez noted that it was in everyone's interest to know the risks existing around all the Mediterranean Rim. With FAO support, a data bank was set up by Silva Mediterranea, but funds were reduced and, despite efforts to maintain this structure, it was abandoned towards the end of the 1990's.

R. Velez felt that this kind of initiative was vital for an awareness of what was going on in other countries.

Recognising the role of woodland owners

Pedro Medrano spoke of the difficulties that plague risk management and the problem of the scattered ownership pattern of woodland holdings, remarking that owners are out of touch with social reality.

He raised the question of the regrouping of plots.

J. Bonnier said that in France, during the recent passing by the legislature of the forestry bill, the section on "management by zoning areas" was rejected by the Senate on the grounds that it infringed property rights¹.

M.V. Fernandez de Cordova reminded the meeting that ownership of property is an established right. She considered that the non-involvement of landowners is due to the over-regulatory character of legislation and the heavy presence of the state. In her opinion, what is needed above all is to identify the owners, increase their awareness and train them in woodland management.

J-P. Gautier suggested that the state acquire land in the public interest as it did in France in the 19th century when it undertook the restoration of land in mountainous areas.

R. Velez thought it would be very difficult to get acceptance for such a measure because the present trend is towards less state intervention. He stressed again the importance of silviculture in the prevention of risk. However, it must be carried out by the landowners, public or private. Thus, something must be done in the direction of landowners. Getting them involved in the management of their property will have a cost for society but, in return, society will obtain numerous benefits (in leisure, protection from risks...).

R. Montoya emphasised that the use of woodlands by society at large is effectively very considerable in Mediterranean regions. Yet these woodlands are the property of private owners who allow society access to them. If we want this situation to continue and preserve the land, then the state and administrative bodies will have to take action because the use is public and not private.

CONCLUSIONS FROM VALENCIA

The seminar "Risks Threatening Mediterranean Woodlands and Natural Land Areas and the Role of Woodlands in Risk Prevention" resulted in the drafting of a number of conclusions which have been named "The Conclusions from Valencia".

Within the framework of the Interreg IIC programme entitled "The Problem of the Mediterranean Forest", in which are involved the Provence-Alpes-Côte d'Azur (France) and the Campania (Italy) Regions, a group of experts on risks met with representatives of the International Association for Mediterranean Forests in Valencia (Spain) on 8-9 June 2001, at the invitation of

¹ The French Parliament has reestablished, by its inclusion in legislation, the possibility of projects covering a whole forest area considered as an entity.

the Environment Council of the Valencia Region. The meeting undertook a consideration of the situation regarding forests around the Mediterranean Rim and adopted the following conclusions :

1. Mediterranean woodlands are made up of natural land environments that are subject to a Mediterranean bioclimate. Such woodlands range from extremely deteriorated areas afflicted by erosion to the most magnificent stands.

These woodlands are subject to various risks, some natural, some human, which threaten their function in protection or production as well as in their social and cultural role. Yet these functions or roles are all indispensable if human activity in the region is to reach its full development.

2. Certain risks, like wildfire, have increased over the last few decades, bringing in their wake other problems such as erosion, the increase of pests and diseases, a decline in water reserves and the development of urbanisation.

Risks, interacting with natural phenomena like drought, increase the vulnerability of woodlands and lead to people being endangered. Hence the need to take preventive measures to avoid the accumulative effect of the various risks.

3. Socio-economic factors influence the evolution of risk e.g. the abandonment of agricultural land on the northern side of the Mediterranean Rim ; human pressure on woodlands on the southern side; the gulf that is generally widening between urban and rural populations.

4. The risks that threaten Mediterranean woodlands are not well understood in countries that are not themselves Mediterranean. This fact has negative consequences on policy decisions made by international organisations or leads to their lack of interest in Mediterranean matters.

In particular, it has been noted that, in certain situations, European Union sheep and goat livestock grants have generated increased risk of wildfire on account of inadequate prior consultation and cooperation between the forestry and livestock advisory services.

Similarly, the FAO has significantly reduced the activity it used to foster through the Silva Mediterranea commission.

This situation contrasts starkly with the need to counteract the desertion of rural areas by their inhabitants which is the ultimate risk threatening extensive mountain regions around the Mediterranean.



5. It was felt to be essential to bring society at large to an understanding of the vital role played by Mediterranean woodlands in the quality of the Mediterranean environment. It seems clearly indispensable that a policy specifically for Mediterranean woodlands must be designed and put into effect.

To this end, we need to develop a broad vision of woodland management, centred on silviculture and coordinated with land use development policy, having as its aims :

- ◆ that forests should be wanted and considered useful by the whole population as fitting in with its actual needs ;
- ◆ the establishment of a reasoned management policy, based on scientific and technical knowledge and know-how, that will take into account the interrelation between risks of wildfire and those from pests, disease, erosion, flooding and loss of biodiversity ;
- ◆ the bringing together of all concerned with Mediterranean woodlands so that everyone can submit his or her ideas about policies and collaborate to get them put into effect. Such people include, notably, public and private owners of woodlands, professional foresters, researchers, fire prevention and firefighting authorities, local elected bodies, the media, NGOs and managers of protected areas and reserves.

6. It was felt that the prevention and control of risks that threaten woodlands can only be achieved with the full involvement of owners who, on the northern Mediterranean, are mostly private; and, on the southern side of the Rim, of users.

To this end it is necessary to promote effective organisation of voluntary associations which facilitate sustainable development of woodlands. This point was recently accepted in various international gatherings, including ministerial conferences at Helsinki and Lisbon.

7. It is essential that the damage resulting from the various risks that prevail around the Mediterranean be monitored. By this means, their extent and evolution can be assessed as a means of foreseeing short- and middle-term problems via an overall map plotting risk factors.

In particular, we should base efforts here on the decentralised databank of forest fires that was set up in the 90's by the FAO's *Silva Mediterranea* commission.

By the same token, we consider that it is necessary to create and distribute maps charting the wildfire threat during the peak risk periods throughout the whole of the Mediterranean zone.

Furthermore, it is essential to extend to the eastern Mediterranean and North African areas the programme for monitoring the state of forest health that presently covers a large part of Europe.

For all these aspects, we feel that it is essential to contact the European Commission in order to highlight the desirability of updating and reinforcing the regulations governing protection from and prevention of wildfire and pollution.

8. We need to establish a Mediterranean-wide strategy for mutual help in times of acute crisis due to wildfire or predators (for example, locusts). This strategy should be based on bilateral and multilateral agreements between states, facilitating the loan of equipment and offers of help from areas able to make such things available to other areas under the greatest threat.

9. There is a need for study of risk due to other factors capable of affecting woodland environments, such as the expansion of invasive species, be they plant or animal.

10. As a final recommendation, we consider it necessary to tackle the risks to Mediterranean woodlands in a preventive manner, in conformity with present and future models derived from dynamic socio-economic and forestry factors.

We thus propose continuing the work undertaken at the seminar in the light of the current project "The Problem of the Mediterranean Forest", notably within the framework of the Interreg IIIB programme; and that the International Association for Mediterranean Forests continues its activities for the promotion of exchanging information.

With all these points in mind, the participants recommended that the *First Mediterranean Conference on Forests and Natural Land Areas* be organised and held in the near future.

TRAINING, RESEARCH, RAISING PUBLIC AWARENESS*

Michel BARITEAU**

INTRODUCTION

The aim of the work group "Training, Research and Raising Public Awareness", led by Michel Bariteau, has been to identify those issues of training, research and raising public awareness specifically related to Mediterranean woodlands.

The seminar of May 14-15, 2001, following on a preparatory meeting held on February 12-13 in Avignon, sought to investigate the issues highlighted at the first meeting.

During the earlier workshop, it was decided to merge into one theme the topics of research and training and to treat as a second theme raising public awareness (understood in its broadest sense to include informal educational activity¹ and communication designed to make decision-makers as well as the general public aware of the problems confronting Mediterranean woodlands).

Discussion thus centred on these two themes. Key figures from around the Mediterranean Rim were invited to submit their views on each of the topics. The second morning was devoted to debate on the points that emerged from the first day's discussion, with participants from each country summarising their particular point of view.

In effect, the proceedings highlighted the great diversity of the issues involving Mediterranean woodlands. A clear account of this diversity forms a preamble to this report which then goes on to treat in detail the two themes "training and research" and "raising public awareness".

* Workshop held on 14th-15th May 2001 in Marseille (France).

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¹ Concept proposed by Pierre Clément (see list of participants).

DIVERSITY OF THE ISSUES INVOLVING WOODLANDS IN THE COUNTRIES OF THE MEDITERRANEAN RIM

The issues are not the same from one side to the other around the Mediterranean and they also differ between some European countries. Overall, there are three types of woodlands :

- woodlands subject to intense human activity : integrated into agri-silvi-pastoral systems of production that are various and sometimes contradictory, such woodlands in countries around the southern Rim display the dynamics of decline,
- forested land, spreading in extent in northern Rim countries, whose management aims above all at limiting wildfire. It is often seen as marginal compared to the forests elsewhere in Europe,
- forests where management aims at wood production, mainly in Portugal but also, to some extent, in Spain.

Forestry issues in countries of the southern Mediterranean

North African woodlands : a multi-functional environment

Participants from Tunisia and Morocco, notably Omar M'Hirit and Habib Abid, presented the issues confronting North African woodlands.

There are three distinct woodland contexts :

- the Mediterranean area, the least extensive, made up of big forests with high trees, and maquis and garrigue bushland,
- a sub-Mediterranean zone covered by formations of shrub and steppe (argan tree, acacia...),
- the Sahara area.

North African woodlands share common features, both ecological and socio-economic :

- limited supply of water,
- immense arid areas,
- high proportion of woodland (leaving desert out of account),
- high population densities in woodland areas,
- highly deteriorated woodlands.

Forestry policies in North Africa at the present time are designed above all to protect woodlands against deterioration and their transition into desert. Such policies concentrate on replanting. Campaigns to raise public awareness are directed at the rural population and emphasise problems of overuse and the pressures on woodlands.

In this region, the forestry issues are at the same time environmental and socio-economic. Woodlands here are threatened by a heavy population that lives from agriculture and uses forest resources (firewood...) in an arid environment that reinforces phenomena of deterioration.

O. M'Hirit reminded the meeting that the use of public woodlands was for a long time surrounded by constraints and subject to severe repression. Acknowledgement of the needs of peasants has led to changes. An effort has been made to establish a dialogue and reconcile the needs of the population with the requirements of forest management. This evolution forms part of an overall process that got under way after the Rio Conference.

The socio-economic context of North African woodlands must be taken into account in research and training. This context is very different to that prevailing in Europe.

Foued Maalej noted, however, that woodlands in North Africa are already serving as recreational areas for city dwellers.

The state of forests in Syria and Libya

Mohamed Cheikho gave a rundown on the background and present state of Syrian woodlands. Syria, like North Africa, is a country faced with the problem of drought and in which woodlands are subject to great human pressure.

One study has shown that the forested area in northern Syria has undergone eleven successive occupations during which the woodlands have been seriously deteriorated (especially through the use of wildfire during armed conflicts). Use of wood has been intensive (roofing has traditionally been of wood). The remaining woodlands are made up almost entirely of plant

species that resist fire and are unattractive to grazing livestock.

The overexploitation of Syrian woodlands is at its apogee : woodlands, understood in the broadest sense, now cover only 2.5 % of the country and actual forest less than 1 %.

Ioannis Gitas stated that the woodlands in Lebanon are also in bad condition : wooded areas now represent only 7 % of land area whereas, before the Second World War, they covered 25 %.

Forestry issues in countries of the northern Mediterranean

The increase in forested areas and the problem of wildfire

Contributions from I. Gitas on Greece and Roberto Cavallo on Italy enabled a parallel to be drawn with the forestry issues in the south of France, as well as with those in northern Spain as described by Luis Gil.

The evolution of woodlands in these regions is similar : woodland areas are on the increase, following the abandonment of farmland. The use of woodlands has tended to become service-orientated, leading to a lack of interest for them on the part of the population. Under-use has resulted in a closing over of the vegetation with a greater risk of wildfire.

Subjects for research and training, as well as communication to raise public awareness, often focus on the fight against wildfire, as well as against "(public) indifference" ; they also concern the taking into account of the specificities of the Mediterranean environment.

The marginal status of Mediterranean forests in the European context

Mediterranean forests represent only a small proportion of European forests. This fact explains why Mediterranean woodlands are of little concern at a national or European level.

Jean-Michel Ningre reminded participants that in surface area, Mediterranean forests in France are marginal compared to the total area of forest in France. Indeed, national forestry policy is drawn up at the national level, even though guideline documents offer some latitude for adaptation to regional needs.

At present, French policy is fashioned by two overriding concerns : on the one hand, sustainable



management and maintaining biodiversity ; and on the other, giving priority for grants for tree planting to stands likely to give a profitable return on investment. Thus, anyone involved in woodland management in the French Mediterranean has to juggle with these two determining factors when trying to adapt a regional programme to national constraints.

Cooperation between the different Mediterranean départements (the basic administrative units in France) should lead to coherent management for Mediterranean woodlands, with a taking into account of their specific features. Yet, at the moment, such cooperation only exists in the field of wildfire protection, in the form of the *Entente interdépartementale des feux de forêts* (Interdepartmental agreement on forest wildfire). Jacky Gérard regretted the absence of decentralised national funding for Mediterranean forests which would facilitate a degree of management autonomy.

R. Cavallo illustrated the absence of regard in Italy for regional specificities by citing the Alpine directives applied in the Piedmont region but which are unadapted to local contexts in the south of the region.

Maria Carolina Varela noted that the economic significance of Mediterranean forests in Portugal was badly taken into account at a European level. What is needed is to develop and communicate a message highlighting the value of Mediterranean forest products and to better explain their economic role within the European Community.

The particular case of Portugal and the intermediate character of Spain

Productive forests in Portugal

M.C. Varela presented Portugal as a country that is Atlantic by virtue of its geographical position but Mediterranean through its climate and biogeography.

The ecological characteristics of Portuguese forests make them Mediterranean. However, unlike the bulk of Mediterranean woodlands, these forests are productive : pulpwood from eucalyptus, cork, timber from maritime pine, the holm oak. This type of forest covers one third of the country.

A part of Spanish forest corresponds to this description.

Regional variations in the forestry issues in Spain

L. Gil emphasised the intermediate nature of Spain, where forestry issues vary from one region to another : the south is confronted with a problem of encroaching desert whereas the forests in the north of the country are expanding and display the signs of under-use. Spain also has productive forests, including some in the Mediterranean environment.

This overview, comprising brief accounts about the various Mediterranean countries, gave participants better insight into some situations in various countries. The descriptions gave the broad outlines but did not detail the diversity and complexity characterising each region. M. Bariteau regretted that there was nobody attending from Turkey who could give a point of view from a major country with Mediterranean forests about which it would have been interesting to hear.

The problems facing Mediterranean woodlands around the whole Rim are conditioned by the socio-economic context and the history of each country concerned. The socio-economic, cultural and historic aspects of Mediterranean woodlands should be integrated into training and research programmes.

Mediterranean woodlands are characterised by the diversity of the situations prevailing in them. The difficulty in a communications campaign designed to enhance general awareness will be to associate in the same message an effective common denominator that will not efface the underlying diversity it encompasses.

REFLECTIONS ON THE TOPIC "TRAINING AND RESEARCH"

M. Bariteau reminded all present that at the international level there was clear disinterest in Mediterranean woodlands, a fact which should be considered in conjunction with the lack of appreciation of the "value" of these woodlands. This question is simpler when value is related to timber and assessed in market terms. This is not the case for the Mediterranean Rim where woodlands are by nature multi-purpose, multi-functional and multi-user.

Therefore, Mediterranean woodlands cannot be managed in accordance with northern European models. Researchers and teachers have a critical role to play in modifying outlooks. A better understanding of the difficulties encountered in research and education will enable us to identify the issues that should be dealt with and explore the possible solutions.

Several points were raised during the preparatory workshop :

- the concepts governing forest management have evolved, as has the need to integrate them into training and research programmes. Emphasis was made on the necessity for an interdisciplinary approach,
- there is a need to open professional forestry circles to other innovative training and, similarly, to extend forestry training to professions that are not, strictly speaking, forest-related,
- structures for research on Mediterranean woodlands, as well as the people involved, are scattered about ; there is also a lack of coordination when setting up research and teaching programmes.

In discussion about organising exchanges between researchers and decision-makers or between researchers and users, the work group raised the question of matching subjects for research to the issues preoccupying society at large.

The organisation of research and education on Mediterranean woodlands

O. M'Hirit and I. Gitas opened with a presentation of, respectively :

- the organisation of research and training relating to Mediterranean woodlands in North Africa,
- an example of a research body functioning at the Mediterranean level : the ICAMAS.

Lastly, Gérard Falconnet and Jacques-Louis de Beaulieu gave examples of education on Mediterranean woodlands in France.

The organisation of research on and education for Mediterranean woodlands in North Africa

ENFI : Ecole nationale forestière d'ingénieurs

The National Forestry Institute for Engineers – ENFI – is an example of cooperation between the countries of North Africa.

Up to 1968, the majority of forestry managers were trained in France. In 1967, at a first meeting in Tunis, formal recognition was given to the specificity required in the management of Mediterranean woodlands and the fact that the assorted European training pro-

grammes were ill-suited to local situations. The ENFI was therefore set up in 1968 on the initiative of the authorities in Tunisia, Algeria and Morocco, with the backing of the FAO and the UNPD. Later, this institute came to include other countries in Africa and the Near East.

At the present time, the ENFI trains forestry engineers at university degree level as part of a "general forestry" programme. The students can specialise at doctoral level : forestry planning and development, ecology and resource management, profitable uses for woodland products, woodland economy.

The ENFI also undertakes specific projects in research and cooperation with other universities :

- in the preparation and supervision of doctoral theses,
- in applied research carried out through the terms of formal agreements.

O. M'Hirit regretted that at degree level the ENFI only gives one kind of training; he also thought that its efforts in research and further education were insufficient. He mentioned the lack of resources as well as the difficulty in widening the sources of funding.

Forestry research in North Africa

Forestry research in North Africa comes under the authority of the national research centres and various other bodies : educational institutions, universities, other scientific research institutes.

Research centres on the following topics :

- improvement and conservation of genetic resources,
- scientific knowledge, inventory and silviculture,
- profitable use of forest products,
- health protection for woodlands,
- land use planning for forest and woodland areas.

Research programmes in North Africa are not organised according to academic discipline but are based on linked operations grouped together.

The strengths of the research are :

- a longstanding tradition of scientific research,
- a well-suited system of funding,
- a technically competent reservoir of some 500 researchers.

Its weaknesses are :

- lack of coordination between countries,
- lack of exchange between research management, decision-makers and users,
- imbalance between fundamental and applied research, variable from organisation to organisation,



- relative failure to take into account the role of trees and woodland in soil and water conservation,
- ignoring of the socio-economic aspects,
- insufficient share of the national budget and of foreign aid,
- too little transfer of technology and results to the user public,
- poor links between forestry educational institutions and research services,
- the absence of a periodic assessment scheme for research programmes and their personnel.

MAI-Chania, an institute of the ICAMAS

The ICAMAS (International Centre for Advanced Mediterranean Agronomic Studies) comprises four institutes in Bari (Italy), Saragossa (Spain), Montpellier (France) and Chania (Greece). The MAI-Chania, presented here by I. Gitas, is the latest to have been set up. It has a department of "environmental management" which offers courses on Mediterranean forests.

The department offers two kinds of teaching :

- extended courses leading to a higher diploma (DSPU) which can be followed up with a Master of Science (M.Sc),
- short courses (two or three weeks). This second type will soon be replaced by a system of exchange courses in different universities or research centres around the Mediterranean Rim and, also, elsewhere in Europe.

Since 1992, 112 students have taken the DSPU course and 67 have gone on to take an M.Sc. They have come from around the Mediterranean but also from the U.S.A., Great Britain, Portugal and Niger.

Previously, there was a module specifically for forestry management. At present, teaching is directed towards environmental management and courses include the following modules :

- statistics and running a database,
- geographic information systems, interpreting photography and remote detection,
- study of ecosystems,
- assessing impact on the environment,
- environmental economics.

Given the small demand, it remains difficult to offer courses focusing more on forestry management or having a socio-economic slant. This last aspect is briefly dealt with in the module "the economy of woodland environments". Demand is greater for more vocational courses, notably in new technology. Forestry matters are considered via the issue of wildfire and the impact on the environment.

The MAI-Chania is involved in some thirty research projects on Mediterranean agriculture and environmental problems for which part of the funding comes from the EU.

Researchers collaborate in the Pyrostat and Silva Mediterranea networks on such subjects as :

- database processing for wildfire,
- wildfire prevention.

The MAI-Chania is also involved in the setting up of an observatory to monitor the environment in the eastern Mediterranean.

French education and training for Mediterranean woodlands

The "Specificities of Mediterranean woodlands" course at the ENGREF (French National Institute for Rural, Hydraulic and Forestry Engineering)

The course "Specificities of Mediterranean Woodlands", which began this year, was described by G. Falconnet.

In the past, there had been some teaching on Mediterranean environments within the framework of the normal ENGREF diploma course but this was discontinued. The recognition of a need in France for training in this field, allied to the establishment of a partnership for the training of Tunisian forestry engineers, resulted in the setting up of this new course.

It is a short course aimed at professionals, be they foresters, managers or decision-makers. Teaching is organised around three modules, each taking one week, devoted in turn to types of specificity :

- ecological and cultural,
- socio-economic,
- management.

G. Falconnet was very positive in the conclusions drawn from this first session and underlined the enthusiasm of the teaching staff who took part.

The students, of various professional backgrounds, were mainly from North Africa and France. Many of the French participants came from departmental and regional government authorities, a fact indicating clear interest on the part of political decision-makers. The reduced participation in the second module suggests the limited interest, at least by the French, in the socio-economic aspects of woodlands.

*A higher postgraduate diploma (DESS) :
Profitable uses of plant resources
in Mediterranean regions*

J.-L. de Beaulieu informed the work group of a new diploma course begun in September 2001 in the Faculty of Science and Technology at the University of Marseille-St Jérôme (France). This diploma – a DESS : advanced diploma in specialised study – offers courses on the different types of non-ligneous plant cover and on Mediterranean woodlands. The DESS, entitled "Profitable uses of plant resources in Mediterranean regions", is based on a multidisciplinary approach focusing on plant biology but with some economics and law.

The evolution of management concepts and their integration into educational and training programmes

Training needs for the management of Mediterranean woodlands

H. Abid remarked that discussion had revolved around training the forestry engineer whereas there was also a need to train :

- forester-developers,
- forester-conservationists,
- forester-researchers,
- forester-site managers,
- forester-planners.

There would, therefore, be a clear advantage in training for Mediterranean foresters that included, along with the compulsory themes of any forestry education, the specifically Mediterranean dimension. By the same token, it would be advisable to consider what kind of specific training might be required for researchers working on Mediterranean woodlands.

He also stressed the weak points in training designed for technicians (for example, in relation to social issues, mechanisation of forestry work and GIS) as well as the need for specialist workers in certain fields, notably for harvesting cork.

Multidisciplinary requirements in training programmes

The evolution of the Mediterranean forester towards multidisciplinary skills

O. M'Hirit talked about the change in orientation of forestry policy in North Africa. As of 1975, a silvipastoral programme and a second one on socio-economic aspects were set up. Tunisia and Morocco encouraged their populations to take part in the conception and setting up of development programmes, which resulted in the hiring of sociologists. At the ENFI, revision of the forestry course is being discussed. One of the central issues is the adapting of a forestry engineer's training to encompass general management skills.

Taking the humanities into account in forestry training and education

Vincent Clément reminded participants that forests had generally been thought of as places without either a social context or a history. Over the last ten years, concepts in forestry management have changed, with the socio-economic dimension now being taken into account. He underlined, in particular, the importance of the historical and cultural aspects of woodlands and the necessity of giving them a real place in forestry training.

G. Falconnet stated that the ENGREF course took into account this new dimension through courses on the "specific socio-economic features" and "specific cultural and ecological features", both of which dealt with human relations and the particular characteristics of the people involved. It nevertheless proved difficult to find teachers who were both sufficiently qualified and motivated.

The growing importance of basic education and the concern in southern Rim countries about keeping abreast of new knowledge

I. Gitas stressed the growing importance of basic knowledge and training but, also, the strong demand related to new technology (remote surveillance, GIS, mechanisation...) to the detriment of other disciplines (especially of the humanities). This raises the problem of updating course content as taught to students.

H. Abid stressed the speed with which technology is evolving and regretted the timelag that can arise in integrating such change into curricula in countries around the southern Rim.

G. Falconnet said that the situation was not always negative to this extent : at the National Agricultural Institute in Tunis, the course on reforestation techniques reflects the present state of knowledge.

The reorganisation of the teaching system at the ENFI has been aimed at promoting new information technology. O. M'Hirit emphasised the benefit gained from integrating research activity into course work. Research enables the quality of the teaching to be constantly improved. However, in North Africa the disciplines in which progress has been recent are underdeveloped (computerised documentation systems, systems analysis, modelling design and application and, also, ecophysiology, conservation biology, genetics...).

The need to broaden forestry education

The world of professional forestry is worried about the image it has in society at large. Providing forestry education to a wider audience could help to improve the situation.

M. Bariteau noted that several initiatives are presently under way towards this end.

Extramural and further education

Little exists at present in the form of extramural or further education. The courses on offer by the ENGREF and the MAI-Chania are encouraging developments.

At the ENFI, the new initiatives scheduled between now and 2005 include a further education training course for forestry managers and technicians.

Integrating forestry education into courses in other disciplines

Another way of widening concern for forest-related issues is to integrate them into courses given in other disciplines. The DESS diploma presented by J.-L. de Beaulieu provides one such example.

Diversifying education and creating links

The reorganisation of forestry education at the ENFI, through supra-institutional integration, will facilitate the introduction of core content syllabuses and interdisciplinary crossover, as well as the matching of courses to particular sectors of the economy.

A multi- and interdisciplinary basis for research programmes

The supremacy of multidisciplinary activity in Europe

Research on Mediterranean forests is traditionally associated with the sciences and their technical applications, even though economics, sociology and ecology are just as much involved. M. Bariteau remarked that the issue of a multidisciplinary approach to research, already raised at the preparatory meeting, needs further consideration.

G. Falconnet emphasised the importance of a multidisciplinary approach, indispensable in a Mediterranean environment. Indeed, such an environment is often seen as an excellent testing ground for multidisciplinary activity.

M. Varela noted that one of the directives of the EU's 5th Framework Programme for Research and Development fosters a multidisciplinary approach. Yet she noted that when projects are assessed, some get accepted even when one discipline only is involved. Despite directives, it remains difficult for the multidisciplinary approach to prevail, even when people are aware of its advantages.

The account by M. Cheikho of an example of the interdisciplinary approach at work in a research and development project on the Mont Ventoux, in south-east France (DGRST² "Biological Equilibrium on the Mont Ventoux", 1972-1976) shows, in his opinion, just how far we are from getting acceptance of the approach. Interviews with the various people involved reveal the existence of two groups :

- forestry professionals whose perspective is conditioned largely by wood production,
- research scientists in pure sciences (biology, botany...) whose vision of the forest is channelled by their discipline (for example, plants and the soil do not figure in what entomologists have to say). The humanities are not taken into account in such "interdisciplinary" projects.

The value of system-based research for an interdisciplinary approach

M. Bariteau noted the value of the North African experience, where the approach is based on systems rather than on disciplines. In France, on the contrary, priority is given to disciplines.

O. M'Hirit explained that the system-based approach takes the form of programmes made up of operations

² General Service for Scientific and Technical Research.

and action to be carried out. The different undertakings are ranked in order of the priority given to the programmes and operations. This principle, chosen because it saves costs, is difficult to put into practice and depends for its successful application in a given project largely on the personality of the coordinator.

The system makes it possible, for a particular operation, to focus all available research potential (universities, institutes...). However, this implies that a compromise be found between applied and pure research.

The need for concertation and cooperation at a Mediterranean level

Concertation between training organisations

Mohamed Larbi Chakroun wondered if there was not a risk of duplication between the training available in North Africa and that offered by the ENGREF.

On this subject, O. M'Hirit regretted that no North African specialists teach in these courses.

G. Falconnet replied that the ENGREF training programme had been set up as a partnership at the request of Tunisia. The participation of North African specialists had indeed been programmed but, due to the limited funding available for this first session, it was not possible to pay the travelling expenses of those recruited to teach from the southern Rim. The possibility remains open for subsequent sessions. Collaboration, notably with the ENIF, is feasible, as is the possibility of decentralising some of the course modules. Both the ICAMAS and Silva Mediterranea were approached at the time the training programme was being designed but nothing came of it.

There is a lack of concertation between the different bodies involved in training in Mediterranean forests, as well as a lack of communication between the different countries. Countries around the southern Mediterranean Rim call for tenders but may award contracts to organisations not from the Mediterranean (Canada, Finland...). The training then offered could well neglect specifically Mediterranean features. Thus, it would be advantageous to set up an international network of the different bodies around the Mediterranean involved in training.

What is the role of the ICAMAS in this respect ? It would appear to be the case that, at present, forestry training provided by the ICAMAS is limited to woodland management in relation to wildfire.

Concertation between researchers

M. Bariteau explained that the multiplicity and scattered locations of research scientists working on Mediterranean woodlands have given rise to a need to structure research efforts in this field.

In Portugal, M.C. Varela confirmed the same situation : a scattered pattern of people involved with Mediterranean woodlands, a disorganised field of research and a lack of concertation. This has led to redundant duplication of research programmes at the same time that some aspects have never been tackled. Concertation between disciplines and institutions is poor within each country. How much more difficult to bring about concertation at an international level !

The idea of an inventory of all those involved in research on Mediterranean woodlands had already been mentioned during the preparatory meeting. At present, several already exist, drawn up by the FAO, the IUFRO (International Union of Forestry Research Organisations) and the EFI (European Forestry Institute). None are complete and it is hard to envisage making an exhaustive version, such is the scope of the task. It would appear that the greatest advantage would be obtained by federating those involved in a single network (possibly Internet-based) and establishing poles of excellence on Mediterranean woodlands.

Such restructuring would enhance the chances of acceptance for research projects since these would then fit more exactly into the "network of excellence" forming part of the EU's 6th Framework Programme for Research and Development.

From concertation to cooperation

The scattered location of the people involved, along with the difficulty that researchers and decision-makers have at an international level in concerting their efforts, together explain the difficulty of getting funding for research. At the moment, there are two kinds of cooperation :

- bilateral cooperation, giving rise to relatively modest projects which are, nevertheless, motivating to researchers from the southern Rim because they lead to exchange and meeting with other researchers,
- cooperation on projects set up by international organisations (Silva Mediterranea, UNESCO, IUFRO, ICAMAS...), but with only a small part devoted to woodlands.

To make cooperation more likely, O. M'Hirit suggested we consider drawing up a strategy with, as a starting point, the setting up of a network which should

have as its aims :

- a contribution to the harmonisation of programmes,
- the promotion of exchanges,
- a federating schedule of programmes between the northern and southern Rims (so that the countries of the south can better meet international standards and those of the north feel more concern for the situations faced by their partners in the south),
- support for the initiatives of other organisations (IUFRO, UNESCO...).

His experience of *Silva Mediterranea* led him to stress the difficulties in managing such networks. It is vital to find an organisation which can direct them. Could the ICAMAS play such a role ?

The MEDA programme is a Euro-Mediterranean instrument for cooperation whose objectives are the development and bringing up to recognised level of the southern Rim countries. To what degree could finance for research on Mediterranean woodlands be integrated into this programme ?

Research and the issues confronting society at large

The relations between research and society

According to V. Clément, researchers are rarely in phase with wider society : they are either in advance (thus the need for setting up committees on ethics) ; or behind, as is the case with sustainable development and environmental questions, fields in which the interdisciplinary approach called for by responsible management is far from being integrated into research programmes.

M. Bariteau remarked that while some researchers are only concerned to get their work published, the majority do reflect on the usefulness to society at large of the research they undertake. The programming and orientation of research in the light of social demands is a delicate matter in so far as researchers legitimately claim a degree of liberty and autonomy as being indispensable to their work and to innovation.

The role of relay bodies that disseminate findings

Relay organisations, such as the CEMAGREF in France, facilitate the dissemination of the results of research to a wider audience and maintain links be-

tween researchers and society at large. In this respect, G. Falconnet expressed regret at the present distancing of the CEMAGREF from forest-related issues.

Mohamed Chaouri offered as an example the forestry department of the University of Hamburg (Germany) which is working in cooperation with a centre for profitable uses of woodland products.

Defining research priorities

Drafting programmes raises issues concerning society at large. Thus, researchers and decision-makers need to concert their efforts.

M. Bariteau reminded participants that mixed forums exist, such as the DADP (Department for Development and Planning) of INRA (French national agricultural research body), or the French Forest History Group, where concertation is possible. There is also such a body at the international level : IUFRO. A body specifically devoted to research on Mediterranean woodlands does not, however, exist.

Research on Mediterranean woodlands should correspond to the needs of the regions. Funding depends on European programmes and, consequently, this often leads to other aspects getting priority, particularly as there is no truly Mediterranean policy in matters of research.

The forthcoming Conference (*First Conference on Mediterranean Forests and Natural Land Areas*) could well serve as a forum for defining research priorities and later, pursuing its fertile reflection, provide input to the Commission in Brussels.

The need for conceptualising research at a Mediterranean level

An understanding of Mediterranean woodlands as a coherent entity would facilitate relations between researchers and decision-makers.

I. Gitas suggested conceptualising Mediterranean characteristics according to the different definitions that can be given to them, using, in particular, the cartography of woodlands. Pierre Clément supported the idea but stressed the major preliminary effort at reflection that such an undertaking would require.

M. Bariteau remarked that it would be worth considering setting up such a project under the auspices of the ICAMAS. He shared the view that present models are by and large imported from Northern European and North American contexts and are not always appropriate to the Mediterranean world. Mediterranean

researchers must, therefore, propose their own concepts. At the same time, they should become involved with the international scientific community, taking part in the major themes that animate it.

ON THE TOPIC "RAISING PUBLIC AWARENESS"

Issues identified at the preparatory meeting

P. Clément presented the synthesis of the work on raising public awareness, written with R. Carvallo following the meeting of 12-13 February.

The synthesis began with a presentation of the classic diagram of the communication chain, well-known to the teaching professions, which may help enhance awareness.

The key questions in this matter are : who emits the message ? What are the messages ? Who are the receivers ? What do they think about the issues ? What situations can be created to facilitate appropriation of the message ? Which messages should be priority and how should they be transmitted ?

Thus, the contents of the message will depend both on the sought-after objectives and on the (pre)conceptions of the receivers.

Using an approach through semantics, P. Clément highlighted the multiplicity of terms used to designate Mediterranean woodlands. A chart was presented, to which additions can be made, which showed corresponding terms in various languages.

A number of questions were raised with a view to establishing a communication strategy for Mediterranean woodlands :

- should this strategy be finalised before the First Conference ?
- what messages should get priority ?
- does a contradiction exist between discourse on protecting woodlands and the discourse aimed at their promotion ? The first stresses the idea of fragility, emphasising the threat represented by human activity, agriculture, civilisation. The second, on the other hand, puts the emphasis on ideas of strength and richness, manifested by the biodiversity of Mediterranean woodlands, their history and their integration into ancient civilisations.

The objectives of and justification for this communication will determine the type and content of the mes-

sage to be delivered.

Two kinds of reflection must be undertaken :

- a consideration of the deeper, underlying issues, the aims and the content of the messages for raising public awareness about Mediterranean woodlands.
- more strategic consideration of the means and methods to be used, as well as the messages to be transmitted.

Experience in raising public awareness of Mediterranean woodlands

Up to the 1990s, attempts to raise public awareness in North Africa were practically non-existent, apart from a smattering of programmes, conducted on-site, aimed at a school or university audience and a few messages on hunting or wildfire.

The forestry of the time stayed pretty much in its shell. Moreover, the rare programme or message concerning public awareness was always designed in-house, without recourse to external specialists in communication.

Since 1990, with the evolution of concepts in forest management and the desire to involve the population in development projects, programmes and action have been undertaken to raise public awareness about the problems confronting Mediterranean woodlands.

These programmes and action have the following aims :

- to reduce the pressure of human activity on these woodlands and the risks threatening natural areas,
- to promote new activities in such areas,
- to encourage the organisation of the population into voluntary associations, encourage investment and sustainable development...
- to propose well-adapted techniques and solutions, as well as alternatives for getting the most (profit) out of the woodlands.

The targeted groups are :

- the woodland population (users, development committees and *daour*, forestry associations) via the development of methods of communication/popularising/raising awareness (participative approaches, activity techniques...),
- the general public : initially, the young and the teaching fraternity were aimed at but now there are campaigns aimed at all sections of both the rural and urban population,
- funding decision-makers and, also, senior staff



in technical departments (tourism, public works...) involved with forests and other natural areas,

- the private sector (wood industry firms, heads of industrial companies, timber and saw-wood producers, green tourism...).

Agents and partners in raising public awareness :

- ministries of agriculture and the environment which are directly involved or operate through bodies providing training courses or public information services,
- ONGs and international organisations.

The means of communication used are :

- for the general public : the media and special events (special public awareness days...),
- for young people : programmes and events aimed specifically at them,
- for woodland residents : radio, personal approach and contact, special activity events, visits, projects, training courses...

The radio and television programmes for raising public awareness produced by the government ministries are aimed at the general public. The technical services and the ONGs address mainly the woodland population. The organisations for popularising and information services look after adult education and vocational training and continuing agricultural training (specialists in forestry and natural land areas are rare in these organisations).

The ONGs have a limited effect, and in any case little publicised, because they lack the means. Nevertheless, they have been pioneers in the field of popularising and informing. Voluntary activist organisations, particularly those related to the environment, are proliferating enormously at the moment in North Africa. The media are paying increasing attention to their activities and statements. However, according to H. Abid, action for popularising and general information in no way matches public demand.

Action by the CRPF (Regional Centre for Privately-owned Woodlands) in Provence-Alpes-Côte d'azur (s.-e. France)

Two thirds of French woodlands are privately owned. The CRPF is a public organisation specialising in privately-owned forests.

The Provence-Alpes-Côte d'azur (PACA) Region CRPF has undertaken a programme to raise the awareness of landowners on the following topics :

- the advantages of fostering plant dynamics (culling and thinning),
- the unavoidable fact of wood production and the

necessity of harvesting the wood,

- the advantage of replanting former farmland with specific tree species rather than leaving it to revert to scrub.

Because income from production cannot work as an incentive in the Mediterranean regions, other motivating topics such as property rights, the role of woodlands in tourism or better understanding of tree species need to be the focus of methods for raising awareness. Field agents generally operate within the framework of pilot projects, such as the setting up of practical itineraries based on techniques, or on meetings with motivated landowners.

The means used for raising awareness are :

- meetings on given themes with invitations to landholders and political leaders (personal invitations and press announcements),
- a newsletter aimed at maintaining links, sent to all owners of more than 10 hectares of woodland (a limit fixed for financial reasons),
- information sheets presently being written.

The main difficulty encountered by the CRPF is the great number of landowners and their scattered location. There are, in effect, 250,000 owners of woodlands in the PACA Region. It is difficult to meet them all or, indeed, even to identify them because the official land registries are not always up-to-date.

The woodland owners' lack of motivation in looking after their holdings is linked to :

- the dividing up of inherited land which remains unfinalised for many owners,
- a high average age : a third are over seventy, two thirds are over fifty,
- a feeling of failure related to the collapse of agricultural activity generally, which is associated with woodland encroachment on abandoned farmland,
- pressure from society against intervention in forested areas (this is connected to the idea of nature as wilderness).

The CRPF is presently involved in getting under way an approach based on "whole forest units". The idea is to propose to woodland owners a "turnkey" operation. Occasional experiments on such a basis have proved very positive, especially among small owners. The "whole forest unit" approach enables optimal use to be made of staff deployment.

"Forestour", a project now under way, is based on the idea of providing tourist services within the forests (in the same way as farmers host paying guests). Though it still involves only a minority of woodland owners, it brings a return and encourages people to improve their management.

L.-M. Duhon expressed regret that the activity of the

CRPF was not backed up by a management body as is the case in Catalonia (which, in fact, got its inspiration from the CRPF idea).

The challenges and issues at stake in raising awareness about Mediterranean woodlands

The challenges and aims of raising awareness

Defending woodlands against indifference

Jean Bonnier stressed the interest of the PACA Region CRPF trial project whose problems foreshadow the threat that looms over Mediterranean woodlands : the widespread lack of interest by the general public in its woodlands. In the PACA Region of s.-e. France, with a population of five million, the 250,000 woodland owners represent 5 % of the population and around 15 % of heads of families. This is a bigger group than either the hunting fraternity or ecologists. Yet as a group it never gets a mention.

This betrays the lack of interest shown by owners in their holdings as well as that of local authorities in the publicly-owned woodlands. The situation is the same in Italy and in Catalonia. There is perhaps some point in wondering whether there is a connection between a society's lack of interest in its woodlands and the level of its economic development.

L.-M. Duhon added a rider to these observations in pointing out that the owners to whom a project was submitted generally reacted very positively. The lack of interest being talked about really manifests the absence of projects on the part of decision-makers : people do not know what to do nor how to do it. The problem is basically political.

One of the challenges for communication on Mediterranean woodlands is what J. Bonnier calls, in cleverly deviating the French abbreviation DFCI³ : *Défense des forêts contre l'indifférence*.

Recognition of the specific characteristics and economic value of Mediterranean woodlands

L.-M. Duhon pointed out that the Bianco Report⁴ provided an opportunity for the recognition of the spec-

ific characteristics of Mediterranean woodlands. However, this opportunity has not been exploited. The PACA Region CRPF has some difficulty at the moment in spreading the idea.

During an open discussion, the marginal status of Mediterranean woodlands at a European level was mentioned : their small extent hinders their specific characteristics being taken into account during the drafting of forestry policy.

M.C. Varela emphasised that the European Commission does not give enough weight to the products coming from Portuguese forests : cork is discussed as though it were an imported product whereas the world's number one cork producer belongs to the EC.

The second challenge to raising awareness of Mediterranean woodlands is getting their specific characteristics taken into account in national and international management programmes, as well as getting recognition for their importance or their economic significance.

Raising awareness of the socio-economic and cultural aspects of Mediterranean woodlands

North African participants have frequently underlined the socio-economic context. Consideration of the socio-economic, cultural and historical aspects of Mediterranean woodlands has been one of the issues featuring in the discussions on research and training.

Amar Madoui⁵ insisted on the importance of a participative approach and, also, on the need to make sure man is not excluded from the woodlands. The idea must be spread that Mediterranean woodlands form a part of civilisation.

Raising awareness of the risks threatening Mediterranean woodlands

In Europe, the federating discourse on Mediterranean woodlands centres on the prevention of wildfire.

In A. Madoui's view, inhabitants should be kept informed of other harmful aspects which, around the southern Mediterranean Rim, also constitute a real threat : for example, over-use through collecting firewood or through grazing.

³ DFCI in French stands for *Défense des forêts contre l'incendie*.

⁴ Jean-Louis Bianco, French M.P., wrote the report "The Forest, France's Opportunity".

⁵ A. Madoui was unable to attend the seminar. However, he submitted a written contribution which was read out to the assembly.



Promoting and making gainful use of forest products

In M.C. Varela's view, forest products, and cork in particular, need to be shown at their real worth. Companies making plastic substitutes for cork for bottling drinks produce publicity and advertising in far greater quantity and more hardhitting than that funded by the cork-related industries.

Difficulties related to differences over issues and opinions about woodland management

Differences in the issues between the northern and southern Rims

As M.L. Chakroun emphasised, seen from the point of view of land-holding patterns, the woodlands around the northern Rim are characterised by the widespread dividing up of private property whereas around the southern Rim forests are in the hands of the state. Thus, while the problems related to communicating about Mediterranean woodlands are similar, they occur in different contexts. Further reflection is required on this matter.

M. Bariteau added that in the south the woodlands are clearly seen as a source of real, vital worth whereas, in the north, such recognition is far from being the case.

A. Madoui reminded participants that the discourse on the extension of woodlands only concerns the northern Rim.

Thus, the issues involved in putting together discourse on Mediterranean woodlands diverge mainly in two respects :

- the dynamics of plant cover (forested area spreading around the northern Rim, woodlands suffering decline through over-use around the south),
- population factor (landholders mainly private in the north; in the south, users of largely publicly-owned woodlands).

O. M'Hirit noted, furthermore, that the interests of the population in these two parts of the Mediterranean are not the same (50 % of the population around the southern Rim is rural).

J.-L. Beaulieu did not think that the differences in context would constitute a stumbling block. If the woodland owners to the north and the users of woodlands to the south are considered together, it is clear that both groups would benefit in equal measure from

raising awareness of the importance of Mediterranean woodlands. This importance can be treated via different issues and challenges, to be chosen according to the targeted audience.

Discussion on the need for management or non-management of the woodlands

M. Bariteau observed that throughout the discussion of themes and issues involved in attempts at raising public awareness there was an underlying presupposition that woodlands need management. Is this a real need or could non-management be envisaged ?

Daniel Vallauri pointed out that the WWF does not agree with the discourse claiming "the threat of wild forests". He explained that the forests that appear menacing are untended pioneer stands. Non-management does not lead to impenetrable cover, it is lack of maturity in stands that makes them impenetrable.

P. Clément added that this idea of the menacing forest includes a cultural determinant linked to mystery and legends. The debate on the need to manage woodlands or not highlights two different views of the forest. Such divergence of view underlines the problem of finding a common message federating, by its mutual import, either those emitting the message or those receiving it. Who is to emit the message ? Should there be a single source or several ? Should there be one message only ?

The question of who emits the message and the position of the IAMF

P. Clément designated the IAMF as the assumed emitter of future communications on Mediterranean woodlands. He suggested that the stakeholders and potential partners involved in such communication be identified in order to reflect on the status and credibility of such message-givers.

D. Vallauri felt that the idea of a single message-giver was not necessarily good : it could lead to a single view being put across and this could lessen opportunity for discussion. It would be preferable to take advantage of the fact that associated partners complement one another.

Communicating on Mediterranean forests involves, at one and the same time, a "communication as raising awareness" aspect which concerns everybody connected with Mediterranean woodlands ; and the IAMF's "own communication", notably in relation to the

Conference.

These two facets led J. Bonnier to consider the role and place of the IAMF within the networks that exist linking people involved in Mediterranean woodlands. In earlier times, the lines of agricultural or forestry popularisation or training were clear : the engineer who "knew everything" transmitted his knowledge to the rural peasant. Later, the various other players involved were taken into account. This gave rise to a centralised communications system in which all information was funnelled to a central unit which then disseminated it. But the central unit became the battlefield for power struggles and rivalry which vitiated the scheme. Communicating then took place haphazardly, done by the different parties involved, more or less effectively. What counts is not to dominate this system but to understand the best way to take part in it so as to facilitate communication.

Which audience ?

Identifying the receivers.

Decision-makers are to be the targeted receivers, as understood in the broadest sense. P. Clément would like to identify them more explicitly. We can address them directly or via the public at large.

Youssef Nouri suggested in this respect that we inform such bodies as the MCSD (Mediterranean Commission for Sustainable Development). This Commission, set up in 1996, is unusual in that it includes representatives both of government and of wider society. 25 states and 15 NGO's are members. The Commission only has a consultative role but its opinion is highly regarded : when it intervened on questions concerning the Mediterranean coastal areas, it obtained an immediate response from governments.

The IAMF is a member of this Commission. For the moment, our Association is restricting its role to that of observer of the ongoing programmes with a view to seeing if the issue of forests at risk can be integrated into them. M.L. Chakroun underlined the interest that this Commission represents, along with the Barcelona process : initially focusing on protection of the Mediterranean from pollution, it is now showing concern for the shore and the woodlands...

The MCSD should be taken into account within the framework of the Conference.

Receivers' (pre)conceptions

On the subject of preconceptions, P. Clément quoted

Jacob von Vexküll who wrote, as early as 1934 : "No forest exists as an objectively determined entity; there is :

- a forest for the forester,
- a forest for the hunter,
- a forest for the walker,
- a forest for the nature lover,
- a forest for the collector of wood and gatherer of berries,
- a forest of legend in which Tom Thumb got lost."

This quote reveals the need to identify each person's (pre)conceptions because the differences may end up as so many hindrances to effectively increasing public awareness.

Divergences were already apparent during the preparatory workshop :

- Some associate the forest with the idea of a resource, whereas others see it as a natural environment.
- Equally, some contrast the idea of a "looked after" forest with that of untouched wilderness.
- The notion of Mediterranean forest ranges from a densely wooded area to varying degrees of open woodland.
- Should the idea also include the complementary triad of climate-culture-forest ?

M. Cheiko pointed out that it would be better to speak of Mediterranean environments rather than Mediterranean forests.

Finding a federating message designed for every audience

Faced with such divergency of viewpoints, it appears essential to identify cohesive aspects likely to federate. At the time of the preparatory meeting, it was suggested that fire was such a unifying theme : "forests are what burn when wildfire strikes". Another such theme was Mediterranean literature or civilisation.

The image of the forest as conjunctive tissue was also proposed. This idea conveys quite well the idea of a diffuse link extending throughout an area. However, to be effective, it presupposes a certain level of scientific awareness.

Diversifying the message to match the receiver

M. Cheikho and P. Clément proposed diversifying the message to match the receiver. The overall aim is to get Mediterranean woodlands valued for their true

worth, especially at international level. Neither believes in a single universal message, because of the complexity of woodlands, the difference between the situations in the northern and southern parts of the Mediterranean Rim, and the diversity of the audience.

Thus, M. Cheikho suggested that the message aimed at decision-makers be shaped by three main considerations :

- the existence of woodlands not *per se* but as a function of a given context,
- the multifunctional dimension of Mediterranean woodland environments,
- the rights of future generations.

For educators, on the other hand, emphasis should be put on an interdisciplinary approach and action in the field. For managers, the region's specific features should be highlighted while, for the general public, the stress should be on risks.

P. Clément considered the three main types of receiver : decision-makers, citizens and private landowners :

- For decision-makers (the priority target), the message should first promote Mediterranean woodlands in order to broaden policy that is often limited to wildfire protection.
- For the ordinary citizen, the message should concentrate on the fragility of the Mediterranean environment.
- For private landowners, guidance and advice should be given on forest management and the possibility of getting a return.

What discourse for promoting Mediterranean woodlands ?

The protection-promotion alternative and which features of Mediterranean woodlands to emphasise

Faced with the protection-promotion alternative mentioned by P. Clément, most speakers preferred to insist on discourse that emphasised the value of Mediterranean woodlands.

F. Maalej pointed out, however, that the fragility of Mediterranean environments, especially around the southern Rim, hardly fits in with the notion of the richness of Mediterranean woodlands.

Mediterranean forests are atypical yet possess many strong points that we must find ways to highlight. Their image, less spectacular than that of tropical forests, needs to be promoted (by going beyond an image of fragility which causes government action to be limited to a fight against wildfire) : they are multifarious, a

patchwork still lived in and modified in regions of ancient civilisations ; these woodlands are also penetrated by light, and boast a wealth of aromatic plants and landscapes.

A. Madoui mentioned the aspect of medicinal plants which is now gaining importance in Algeria. Mediterranean woodlands host many honey-producing plants and in Algeria offer potential for truffles.

The importance of the biodiversity of Mediterranean woodlands was emphasised on numerous occasions. D. Vallauri stated that the WWF is interested in the Mediterranean region because the organisation has identified the area as a priority zone.

By way of illustration, M.C. Varela referred to the EUFORGEN networks (conservation of genetic resources), now extended to include the Mediterranean regions. The "conifer" network, for example, which contained only a handful of species before the inclusion of Mediterranean countries, now contains twenty eight. She reminded participants that during the last Ice Age, the Mediterranean region served as a final refuge for many northern European species.

M.C. Varela also mentioned the valuable role played by Mediterranean woodlands in the fight against erosion and in regulating hydrological systems.

Lastly, along with L. Gil, she spoke of the social value of Mediterranean woodlands. F. Maalej underlined their recreational function.

Promotion of Mediterranean woodlands using a transversal approach

The necessity for a transversal approach

Roger Cans observed that, generally speaking, the forest is not a newsworthy subject : it is spoken about only when there is a problem (wildfire, storms...). "10,000 trees growing make no sound ; one that falls does." Indeed, Mediterranean woodlands are more often in the news because they are frequently victim to wildfire.

In R. Cans' view, woodlands must be "sold" as an annex to bigger topics (global warming, the role of forests as a carbon sink...). He cited the example of Peugeot : the company is using the forest in the media via a tree-planting campaign aimed at combating global warming.

On this topic, P. Clément highlighted a basic problem : how to reconcile effectiveness in the media with scientific accuracy. Though the impact of media advertising is apparently big, what is the actual environmental impact of the campaign ?

R. Cans believed that we will not succeed in capturing public interest by talking only about forests. This topic must be broached transversally, via other themes.

The "econodiversity" of woodlands and local preoccupations

How can decision-makers in each region be persuaded that their woodlands are important ?

To this end, R. Cavallo expanded the notion of biodiversity of Mediterranean woodlands to their "econodiversity". In each region around the Rim, woodlands are characterised by a specific value and function which derive from the local context. We need to identify such interest. Thus, in Italy, woodlands play a vital role in the quality of the landscape but in some regions local interest centres on civil defense (Campania, Piedmont : woodland management as a means to managing the watershed). Elsewhere, interest focuses on their role in the agri-silvi-pastoral system (Umbria and, again, Piedmont).

To convince decision-makers of the value of Mediterranean woodlands, the subject must be tackled from that audience's perspective : understand what they think about woodlands and then identify the advantages they offer in relation to locally important issues, both economic and social.

What is involved is decoding Mediterranean woodlands using a filter shaped by local economic parameters. This, as R. Cavallo has pointed out, is indeed complex.

Integrating Mediterranean woodlands into Northern European preoccupations

Mohammad Scharai-Rad pointed out that some environmental tools from Northern Europe could be turned to good use in the attempt to raise awareness about Mediterranean woodlands. Enhanced awareness could be integrated into some Northern European programmes in so far as it coincides with their concerns.

He gave as an example ecological monitoring : Life Cycle Assessment. Various studies involving this topic have shown the positive role that wood products play. Mediterranean woodlands and their related economic sector could gain an enhanced image by using such assessments in promotional discourse.

Furthermore, reforestation programmes in Algeria and Tunisia could fit into European funding schemes devoted to limiting CO₂ in the atmosphere.

M. Bariteau underlined the advantage of communicating on Mediterranean woodlands by paying due attention to the issues that concern Northern European decision-makers. These are the people who decide the framework policies that Mediterranean woodlands have to fit into.

D. Vallauri reiterated that the general view of Mediterranean woodlands has been strongly shaped by painting and by tourism as undertaken by Northern Europeans.

Attention-grabbing themes to present Mediterranean woodlands

What is required are attention-grabbing themes that, at one and the same time, federate the whole Mediterranean Rim, address the specific characteristics of the Mediterranean world, take into account regional preoccupations and mesh with the environmental issues that dominate worldwide.

M. Bariteau suggested emphasising the encroachment of desert. This theme, which the media find quite interesting, is a crucial problem around the southern Rim and also affects southern Spain. It can also touch the northern Rim via the Sirocco. Finally, it is connected to global warming, a topic of international concern.

O. M'Hirit suggested associating forests to the theme of water which is a fundamental preoccupation around the southern Rim. It is of general interest, in terms of quantity in the south but of quality, too, elsewhere. R. Cans approved the idea of using water as a federating theme to unite the northern and southern Mediterranean. He recommended linking the image of Mediterranean forests to that of the Mediterranean sea.

In M. Cheiko's view, what is required is the right "packaging" for the message about the need for paying greater attention to Mediterranean woodlands. Art, culture, gastronomy... offer a range of approaches in the media to Mediterranean woodlands.

Means of communicating with the general public

Television

The idea of a television programme on the forest had already been raised during the preparatory session but reactions differed considerably.

A. Madoui stressed the advantage of the idea. He noted that the University of Setif organises day events



of scientific films at which it might be useful to screen a television documentary on the forests.

R. Cans reminded participants that, unlike the sea or the mountain, the forest is not an eye-catching theme.

The experience recounted by O. M'Hirit about an attempted programme on the forest in Morocco confirmed this point : together with the Moroccan forestry services, he had tried to get forestry-related issues integrated into the subjects dealt with. After two broadcasts, however, the T.V. channel had to abandon the idea because of a lack of audience. The forest does not interest the general public, whereas pollution or sanitation does.

R. Cans, who takes part in programmes on the environment, reemphasised the necessity to couple every mention of the forest with some other topic (whisky with the Irish forests, the Bay of Along with the Vietnamese forest...). This again underlines the need to approach the forest transversally, or laterally.

R. Cavallo cited a farming programme in Italy that indirectly involves the forests : there is a drive through the forest and the programme ends around a table covered with produce coming from the forest. There is also a cooking programme in which the forest, without being the main concern, is shown to the television audience.

Radio

H. Abid emphasised the importance of radio in raising awareness about woodlands among those who presently use them. Programmes can be interactive thanks to the possibility of phone-ins, with their questions and answers.

Publishing

V. Clément stated that, depending on the audience, printed material can also be an effective medium for communicating.

It would be fruitful to develop an editorial policy aimed at the general public (with, for example, a series on remarkable trees or the publication of a survey on Mediterranean forests).

Also, practical manuals could be published aimed at woodland owners. He cited an example from Chile of a forestry management manual for small landowners.

Special events and other activities

Among other kinds of measure for raising awareness, H. Abid referred to various events (fairs, "days" both national and worldwide...). He reminded participants that 2002 had been declared International Mountain Year. In Tunisia, mountain and forest are indissociable. This commemorative year could be the occasion for special events related to Mediterranean woodlands.

He pointed out the interest of African experience south of the Sahara : there, they have a long and rich tradition of using various means for raising public awareness (rural radio, image boxes, community theatre...).

Y. Nouri gave some examples of projects aimed at limiting erosion and the trend to desert, carried out by the environmental protection association at Kairouan in Tunisia. He said that the value of such projects is not only in their results in protecting the environment but, also, in their success at raising local awareness of environmental problems.

Certification Labels

M.C. Varela referred to the existence of a logo authenticating real bottle corks, to distinguish them from plastic substitutes. It is a registered trade mark that is as yet little known or used.

D. Vallauri emphasised that certification labels form a part of communication, particularly in raising general public awareness about environmental issues. The value of wood-related industries could be enhanced by ecocertification. He regretted that the criteria for eco-certification do not correspond to the criteria adapted to the management of Mediterranean woodlands and pointed out that the WWF is, at the present time, promoting other certification labels that it considers better suited.

CONCLUSION

H'Maïed Kouki stressed in the course of the discussion the link connecting the three themes of training, research and raising public awareness.

P. Clément noted that there exists a pool of questions shared by the issue of a multidisciplinary approach to research and education and the issue of the specific characteristics of Mediterranean woodlands. Recognising this common set of questions is one of the critical aspects of raising awareness of Mediterranean woodlands.



M. Bariteau observed that what had arisen from the seminar was a need to organise training and that all those involved in Mediterranean woodlands should learn how to communicate better.

J. Bonnier insisted on the profusion of ideas coming from all those who are interested in Mediterranean woodlands; and on the impossibility of centralising all information. He recalled the paradox faced by research : it must be rooted in the local areas, yet it lays claim to universal application. There is thus a need for a place where the local and the international can confront each other and where researchers of every discipline working on Mediterranean woodlands can meet.

He pointed out that communications is a system requiring time, special techniques and means. This explains why communications, both internal and external, are often neglected by the bodies concerned by Mediterranean woodlands.



COOPERATION*

Jean BONNIER**

Within the framework of the project "The Problem of the Mediterranean Forest", the work group devoted to international cooperation was given responsibility for coordinating the results and wishes of the other five groups, previous to reflecting on the topic of possible international cooperation related to Mediterranean woodlands.

It was decided to focus the group's work on topics and themes that had already been discussed at the earlier meetings of the other groups, classifying and listing them in order of importance ; and thereafter, to examine ways for setting up the hoped-for cooperative ventures.

Just as silviculturalists and environmentalists have trouble finding common ground on which to pursue their aims, whether in the field or in research, or even in their vision of things ; so, too, it proved to be in relation to international cooperation.

THE OBJECTIVES OF INTERNATIONAL COOPERATION

Highlighting the characteristics of Mediterranean woodlands

Cooperating on questions that concern natural woodland areas around the Mediterranean implies, in the first place, agreeing on the fact that Mediterranean woodlands constitute a specific entity with multiple aspects, forming a system that is not only ecological but also economic, social and cultural.

Secondly, it is important to adapt ways of thinking to the nature of the cooperation that it is hoped to set up : a distinction should be made between bilateral cooperative action and multilateral undertakings, i.e. between :

- decentralised cooperation and cooperation at

- national government level,
- action based on a given theme and action having a more general nature.

In every case, if cooperative action involving Mediterranean woodlands is to succeed, the specific features of Mediterranean woodlands, including their historical and institutional ones, must be clearly appreciated : there will be little success when approaches are based on concepts and a mindset conditioned by northern, tropical or meso-European forests.

Moreover, one defining characteristic specific to Mediterranean woodlands is that while they all exhibit constant common denominators, they also possess extremely varied and multiple individual features depending on the areas where they grow.

Inciting Europe and the rest of the world to take into account Mediterranean woodlands

There is a real tendency on the part of countries which are not wholly Mediterranean in climate to overlook the Mediterranean regions in their decisions, claims and actions. This also holds true for international and intergovernmental organisations, such as those belonging to the UNO, the EC and to NGOs¹. The result is that many measures undertaken very often hardly suit the needs of the people and institutions involved in the regions around the Mediterranean Rim.

Furthermore, because the institutional mechanisms of international cooperation as well as the vocation of the people professionally involved in it call for a broad, overall capacity, emphasis is put on their capacity for cooperative action, to the detriment of the Mediterranean world as it really is. As a result, that reality may be less clearly perceived and taken into account.

* Workshop held on the 5th November 2001 in Marseille (France).

** Executive secretary of the International Association for Mediterranean Forests, leader of this work group.

¹ International Union of Forest Research Organizations (IUFRO), Council of European Regions, European Council, professional and voluntary organisations...



This situation seems likely to get even worse when it is remembered that a body like the FAO is envisaging closing down its *Silva Mediterranea* commission ! Thus, one of the objectives of international cooperation for Mediterranean woodlands must be to avoid the involvement of ill-adapted or unsuitable institutions and people and, at one and the same time, to recruit or associate others with the requisite capacities and competence.

Designing forestry policies adapted to development situations in the Mediterranean regions and to the expectations of their societies

From the discussion and the shared experience of participants, it became clear how vital it is that projects for international cooperation in forestry should emerge more closely from the needs of the local stakeholders, on condition that such projects be shaped by the particular issues that confront the people involved. Frequently, however, action concerning woodlands features as an annex to "major" projects. Then such action is based on aims and ambitions that are often unrealistic ; or it takes the form of a local project for decentralised cooperation hastily cobbled together and run over too short a time.

In contrast, no suggestion emerged for a revision of cooperative research projects since such projects are generally well designed and produce good results.

In any event, it is desirable that all the partners involved in any project for international cooperation, wherever they are, should be included in a slowly maturing process of reflection. Indeed, this maturing to fruition forms a fundamental part of all cooperative undertakings.

Getting Mediterranean woodlands onto the agenda

Each of the work groups realised there has been a change in degree in the importance given to Mediterranean woodlands and natural land areas by the people and institutions whose decisions will determine their future. Mediterranean woodlands have seen their role, image and usefulness modified to such an extent that these woodland areas are no longer really taken into account in land use organisation and development. Little by little, the issue of wildfire has eclipsed their economic interest (for wood, in livestock farming...)

which, even though modest, remains indubitable. And today, the protection of Mediterranean woodlands against wildfire is, in its turn, becoming less and less a topic that preoccupies the powers-that-be, notably at the European level.

Thus, Mediterranean woodlands, in their capacity as a fundamental structuring entity in the regions of the Mediterranean Rim, are gradually disappearing from the active concern of contemporary societies that have become more preoccupied with other aspects which, though significant, have only partial and localised importance.

This explains why one of the objectives of international cooperation must be to save Mediterranean woodlands from general indifference.

AREAS FOR INTERNATIONAL COOPERATION

The work group felt that in striving to achieve its major objectives the points raised in the other groups were of real relevance. More so, indeed, because from the collective labours there emerged, by a sort of natural selection, the topics and themes of greatest priority.

These were classified into four fields : understanding, teaching, taking action and communicating.

Understanding Mediterranean woodlands

The present situation

Despite numerous studies, mainly scattered and uncoordinated and thus neither cumulative nor easy to compare, a need was felt for an audit of the present situation which should be a rich vein for subjects for researchers and students.

There is a need to deepen understanding of the biodiversity of habitats and their recent and foreseeable evolution, using the whole range of techniques for observation and inventory.

But such work cannot be envisaged without reference to locally significant factors such as erosion, the tendency to desertification, the health of stands, various types of pollution; as well as to aspects of society such as landholding patterns, the expectations of the general public or the economic importance attributed by a population to its woodlands.

Thus, the inventories and observations which are fre-

quently called for must take into account, more even than data on ecosystems, all information related to the history, institutions, economy and the social fabric of a given region.

Traditional and implicit knowledge

Given the absence of a specifically Mediterranean ensemble of techniques (and of training, too : up to now it has been ill-suited), there is a clear and vital need to accumulate and transmit the traditional understanding and know-how of the peasant farmers who, along with their activity as agripastoralists, are also silviculturalists to varying degrees. Nor must we forget also, depending on the area, the cork workers, wood cutters and merchants and, elsewhere, the charcoal burners, resin and gum collectors, firemen...

This type of consideration goes well beyond its significance as ethnology because it is often only here that we can learn techniques that are not taught in any other place : for example, the "little fire" that has now reappeared as prescribed fire, the all-but-forgotten counter-burning; or the method for running coppice known as *saut de piquet*. Traditional knowledge and know-how can well turn out to be of great use².

Research

Good, longstanding research networks exist, both strictly Mediterranean as, for example, Silva Mediterranea (cedars, wildfire...), linked to the ICA-MAS (International Centre for the Advanced Study of Mediterranean Agronomy), or the Action Plan for the Mediterranean, the regional body of the UN Environment Programme, which also has the same role ; or those linking more far-flung regions : the EFI (European Forestry Institute), the IUFRO (International Union of Forestry Research Organisations) as well as UNESCO's MAB (Man and the Biosphere) programme.

Such networks are themselves linked together in varying degrees.

However, there is no one place where research priorities are debated; and all projects and programmes suffer badly from a desperate lack of an interdisciplinary dimension.

² Cf. Forêt méditerranéenne, Tome VI, volume 2 : Coste D. "Une technique oubliée d'exploitation du chêne vert : le débourage ou saut de piquet".

Uses

Lastly, it appears highly desirable to develop a better understanding of the uses of Mediterranean woodlands, as well as the recent and foreseeable evolution of such uses and the evolution of user conflicts. When all is said and done, it is the uses to which the woodlands are put that shape policy and decision-making.

Teaching - transmitting knowledge

Given the general acceptance that Mediterranean woodlands are socially determined in their character, it behoves everyone concerned (this might be the objective of a collective effort) to :

- on the one hand, develop the interdisciplinary nature of forestry education and training (at all levels) ; and
- on the other, teach about forests to students in other fields of study.

This aim should concern all contexts, whether they involve young students (starter courses) or adults (further education and training). This whole field justifies and requires a major effort of international cooperation.

Taking action - managing

Techniques

As stated earlier, we shall only deal here with those fields which were mentioned during the different seminars of the other work group. So our list is neither logical nor exhaustive.

Naturally-occurring and evolving woodlands have been given particularly close attention : management of existing ecosystems, uncontrolled plant dynamics, natural regeneration, no-access nature reserves...

But, of course, the experience of most of the participants led them to talk of cooperation and exchange on the themes of introducing non-native species and reforestation.

Lastly, what in Italy is called "natural engineering" or, in the language of mountainous land reclamation in French, "biological engineering", as distinct from civil engineering, was also retained as a subject for international cooperation.

All these questions, and indeed numerous others, should naturally arise in the course of actual operations conducted at future pilot sites (cf. further below).

Production

There is a recurrent need to assess the effective social impact or the overall economic value of Mediterranean woodlands, so much the more so because the strictly commercial products of these woodlands procure an ever-decreasing part of the income of local societies.

Procedure

Many participants underlined the necessity for landholders to meet each other. These may be public or private owners, depending on the legal framework of land ownership which varies from one country to another. Their holdings range from extremely small private plots to government-owned state forests, municipally-held woodlands or estates belonging to religious institutions.

To these owners should be added new stakeholders and concerned parties coming on the scene as a result of decentralisation, of the emergence of NGOs or lobby groups.

Taken together, such information has given rise to the idea for another theme for international cooperation.

Protection

Finally, cooperation and, also, mutual assistance were again highlighted as a real necessity in the field of protecting woodlands against wildfire and the threat of pests and diseases. Of course, some networks exist, as in the field of research, but they are either only marginally Mediterranean or not very active.

Thus, as much in the matter of sharing certain arrangements or equipment (for example, in firefighting) as in the pooling of data, or in participating in method design, there is a real need to focus on cooperation (bi- or multilaterally, as the case may be) within a Mediterranean framework.

Communicating

The primary shared objectives in this field are : to vanquish the lack of interest in Mediterranean woodlands shown by society as a whole, at local, national and international and regional levels ; and to contribute to a rapprochement between environmentalists and the professional world of silviculture.

In particular, it appears indispensable that in the awakening of public awareness, recognition be given

to the place of landholders (public or private) and those involved in woodland management, whoever they may be.

In other words, it will not suffice to deliver a shared message on the concept of Mediterranean woodlands ; the concept must be seen to be grounded in the social, technical and administrative reality of such woodlands.

As to the targets for communication, they must first of all include a well-identified public :

- at a local level : rural population, young people, women,
- institutions : elected and other public authorities, NGOs and socio-professional organisations,
- at an international level : the major bodies of the UNO (FAO, UNESCO, UNEP, WMO, ILO...), parties to international conventions (OECD, European Community, Arab Union of North Africa, ALESCO...).

THE OPERATIONAL BASIS FOR COOPERATION

There are not many comprehensive networks for international cooperation centred on Mediterranean woodlands. At an intergovernmental level, only one exists that is wholly dedicated to them, the *Silva Mediterranea* commission. Functioning within the FAO, it enables the forestry commissions of Europe, Asia and Africa to meet each other.

But a number of reasons have led to fears that this commission is losing its importance in the eyes of the FAO : one reason is that in many governments the responsibility for forestry and woodlands is being gradually transferred from the ministry in charge of agriculture to the ministry in charge of the environment.

It was felt desirable that the International Association for Mediterranean Forests, which also forms a comprehensive but non-governmental network, should make known to the FAO its offer to collaborate as a partner with a view to relaunching *Silva Mediterranea*.

Thereafter, discussion turned to cooperation "at grassroots level" in relation to a proposal for pilot sites, an idea that is at the heart of the International Association for Mediterranean Forests' project within the framework of the Interreg IIIB programme.

It is suggested that within the framework of this programme, set up at the European Community's initiative and which should get under way in 2002, the partner regional authorities should choose sites (drainage basin, natural park, rural district...) which will be the



locus for the exchange of people and knowledge.

Such exchanges, bi- or multilateral, will provide greater opportunity to explore more thoroughly the ways for transferring methods and processes than the ordinary application of expertise permits.

The results obtained will be assembled and made known to the different interested parties, notably through the *First Mediterranean Conference on Forests and Natural Land Areas*. The whole will form the basis of a shared corpus of authentic knowledge on Mediterranean woodlands.

Moreover, this undertaking will produce an input of new information and data to the specialised networks for research and cooperation.

ISSUES

This broad overview of the proposals previously drafted by the various work groups has led to their enhancement and also enabled further questions to be raised. These can be summarised as follows :

An assessment should be encouraged of the cooperative projects currently under way around the Mediterranean Rim, examining in particular their weaknesses and bottlenecks and the causes of them.

In the absence of any clearly allocated responsibilities relating to such matters, the International Association for Mediterranean Forests is justified in seeking to partially fill the vacuum in order to foster the emergence of certain models for Mediterranean woodlands.

By now, it is obvious that in ongoing cooperative projects there exist enormous deficiencies related to the woodlands' multifarious social functions, understood in the broadest sense but including their production aspects. For such inadequacies specific action must be taken.

Lastly, there can be no avoiding consideration of how international cooperation is, and can be, financed and how to promote the lobbying of major institutions as a way of increasing funding.

A way forward on these issues has emerged through the twinned programmes of the pilot sites scheme and the *First Mediterranean Conference on Forests and Natural Land Areas*. After getting things off the ground with the First Conference as a kind of launching pad fuelled by experience gained at the pilot sites – a vital but transitory phase successfully concluding active preparation (cf. the chapter on "Societies, Territories, Institutions"), there will then follow another phase boosted by the networks which, where they already exist, should find renewed energy ; or, otherwise, should be established.

EPILOGUE :

WIND-UP SEMINAR*

Jean BONNIER, Denys POULET**

At the wind-up seminar, held at Marseille on 6 November, 2001, the presentation of each work group's synthetical report was followed by debate which confirmed much of the work already accomplished. The debate also gave rise to some new, significant ideas that at times pursued the issues even further, shedding new light on perspectives that had already been opened up.

Such, too, is the aim of this epilogue.

It is impossible to talk about the specific climatic, geographic and ecological features of Mediterranean woodlands, along with their outstanding biological diversity, without an indispensable reference to change : the climate of the regions around the Mediterranean Rim took hold at the same time as man came to live here ; so, Mediterranean woodlands have never been exempt from human presence and, thus, of the changes human interference has produced and, of course, continues to produce. Furthermore, both the ecological state of these woodlands and their legal and administrative status have been totally dependent on the societies that have occupied the various territory.

So, the very notion of heritage, be it common, public or private, has never ceased to vary at the same time as the relative values of the multiple functions of the Mediterranean forests have also varied.

Such unceasing alteration has, need it be said, affected the role and the importance of the people involved in the forests, and their influence in the part played by Mediterranean woodland products in the economy.

At the present time, however, the evolution towards a free enterprise economy in most of the countries around the Mediterranean Rim does not seem to be

leading to greater integration of the products from Mediterranean woodlands into a money-based economy. Parallel to this situation, the commercial value of the classic products (wood, cork, resin) is suffering an overall decline. In contrast, societies are making ever-increasing demands for, on the one hand, security – and, therefore, protection from risks (wildfire, flooding, worsening climate, drying up of water supplies...) – and, on the other, enjoyable conditions. Such non-commercial services can really only be paid for by the public authorities.

Yet the people involved in managing Mediterranean woodlands, whether they be private owners or local and regional councils, have still not found the best way of ensuring that society channels the public resources devoted to paying for such services to those who are best at providing them.

More generally, the scattering of public and management bodies has led to increasing difficulty in designing strategies adapted to the specific characteristics of Mediterranean forests and other woodlands. We do not know how best to register the wishes of the different groups involved, how to coordinate stakeholders, users and management, how to make decision-makers and other audiences more aware of the issues.

These remarks hold true even for the privileged circles of research and education where the internal logic of each discipline prevails over any approach specifically adapted to the Mediterranean context ! This is the reason that, as this present collective work drew towards its conclusion and, especially, after the last exchanges of views that took place during the wind-up seminar, there was a desire to see the continuation or reinforcement of bodies serving as meeting places on the issues of Mediterranean woodlands. These include *Silva Mediterranea*, the Action Plan for the Mediterranean, along with all the others, including the International Association for Mediterranean Forests. There was a desire, too, that cooperation instigated thanks to this current European programme be pursued via the holding of a *First Mediterranean Conference on Forests and Natural Land Areas*.

* The purpose of the seminar was to present the syntheses of each work group in turn and open debate on them. The topics were introduced and the discussion chaired by the respective leaders of the work groups, though Andrée Corvol-Dessert was replaced on this occasion by Cristina Montiel. This epilogue goes over the main points that emerged during the debates.

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MAJOR POINTS EMERGING FROM THE DEBATE

The importance as heritage of Mediterranean forests

- Jacques de Lustrac : The question of heritage is important because it conditions the future and the continued existence of these entities. Forests were long considered to be an undeniable part of heritage. Then, with a decline in their profitability, their value as heritage tended to disappear. Now their value as heritage has made them once again the centre of attention, at the very time the profitability from their exploitation fails to rise, because whatever touches on the environment now generates interest.

What are the foreseeable consequences of this ? Managing an unprofitable heritage is not the same as managing a profitable one. This last form of management is of interest if someone makes a profit from it.

The conflict between rural and urban society is turning to the advantage of city dwellers. We find ourselves in a phase in which value is attached to forests, even when there is no profit to be made.

If Mediterranean woodlands are considered as a part of heritage, they will be protected. If they are not so considered, they will not be protected.

The value of Mediterranean forests

- Cristina Montiel : The economic value of Mediterranean forests is high. It is difficult to measure or assess, their environmental or cultural value even more so. Society is undergoing a process of evolution : everything that has been accepted previously is not necessarily valid now. It is for this reason that a policy for the management of Mediterranean woodlands adapted to the new reality would be very welcome.
- Georges Julien Aillaud : Heritage is often thought of as a non-commercial amenity (pleasure). Nevertheless, it is always possible to establish a price, even if its payment is socially impossible (e.g. payment for going on a walk). In certain situations, the price of a landscape is to be found in the sale of property located in a

pleasant setting.

Fixing a price tag is one thing ; knowing who is going to pay is another !

- Jean de Montgolfier : With a few rare exceptions, such as cork, Mediterranean forests have been unsuccessful in achieving integration in the global economy because what they produce is less and less profitable. Economists can always come up with figures to indicate the value of such forests but this can be a meaningless exercise !
- Ibrahim Nahal : The negative consequences of the disappearance of Mediterranean woodlands (erosion, emergence of torrents, effect on dams...) invest such zones with a value. This can be calculated, even if the result may differ from one region to another.
- Isabel Moreira da Silva : Given that the value of a Mediterranean forest be calculated, how can financial help be given to the owners who must, or will in the future, manage such areas ?

The perception of Mediterranean forests

- Jean-Pierre Gautier : Specific natural characteristics exist and are not going to be modified (or hardly). It is vital to take into account the changes in the make-up of a population (such as the internal immigration within France of people coming to the Provence-Alpes-Côte d'Azur region) which will lead to a change in the way Mediterranean woodlands are perceived.

Nowadays, a rural inhabitant is someone who has fled the city. His or her relationship to the forest will thus be different.

- Turgut Celikkol : Public opinion is not always clearly aware of the risks faced by Mediterranean woodlands.
- J. de Lustrac : Public opinion is a factor that it is vital to take into account. How to communicate with this audience ? Who should take responsibility for raising public awareness ?
- J-P. Gautier : It would be interesting to assess governmental policies for raising public awareness. Have they been successful ?

The evolution of Mediterranean forests

- Jacques Blondel : The key word in the reports on "Cultures and heritage" and "Ecological features specific to the Mediterranean Rim" is change. Change is the driving force in the evolution of biodiversity and is a mechanism for its maintenance and regulation. In ecology, a change is the equivalent to a disturbance. The notion of heritage, of the heritage value of species, is fundamental in ecology because there is change.

Certain aspects of change are beyond our control : climate change, the rise in sea level. Others can only be very partially controlled : the evolution of human societies.

Man has for long been a generator of biodiversity (this is the case when disturbance is slight). When disturbances are too great, they lead to a drop in biodiversity.

Changes in climate will probably have a greater effect around the Mediterranean Rim than elsewhere. At the least, the consequences will be more strongly felt at certain times of the year. A rise in temperature is forecast for the 21st century of 2°-3°C whereas the rise during the 20th century was only 0.6°-0.8°C. In fifty years, Mediterranean ecosystems will be totally different from what they are now. This must be anticipated in research and in the choices societies make.

Society's choices

- G-J. Aillaud : What choices should we make ? Mediterranean woodlands are entities that evolve. Man's action has an influence on these areas. When this influence disappears, natural dynamics take over. Preserving the landscape (very popular at the moment) is the equivalent of freezing a frame in a motion picture : this is not a problem per se but it is a choice that has to be made. One must be aware, however, that such a choice may involve very heavy management costs.
- I. Nahal : Because Mediterranean woodlands are multifunctional, there are more choices to make. But who will make them ? The forestry sector is incapable, on its own, of making choices that are simultaneously technical and social.

- T. Celikkol : On the question of conserving the forest : what should we safeguard; and for whom ? Is conservation possible without economic activity ? It is easier to make choices in relation to Mediterranean woodlands if the socio-economic context is not taken into account.

A solution could be to enhance the value of Mediterranean woodlands in order to help those people who protect them.

- Carlo Bifulco : And how can money be got to the people who live in, or from, the forests ?
- J. de Lustrac : The choices made by those with political power need to be pertinent. Yet it is difficult to recognise which expert opinion amongst those on offer is the most pertinent and most likely to lead to successful carrying out of policy.

How to be operational in tackling the problem of Mediterranean forests ?

- Américo Carvalho Mendes : We must make the utmost effort to be operational and not find ourselves discussing the same things in twenty years' time. There have been numerous interministerial meetings on the forest but that has never resulted in a resolution on Mediterranean forests. Those in charge of government must not be left to look after this aspect on their own.
- J-P. Gautier : Already twenty years ago there was talk about recognition for Mediterranean forests. If we want political recognition, there must be an elected person responsible for forests.

How can society at large be involved in Mediterranean forests, in getting it due recognition, and in its evolution ? How can it be associated to the *First Mediterranean Conference on Forests and Natural Land Areas* and to the present type of gathering ? How can the ordinary citizen be included, he or she who is also an actor in enhancing the appreciation and protection of Mediterranean forests ?

- C. Montiel : There is no magic formula for it. A participative system might be a solution. The structuring of a network of pilot sites is also a means of giving concrete expression to a dynamic which should lead to a true policy of support for the forest.

LIST OF PARTICIPANTS IN THE DIFFERENT WORKSHOPS

LEGEND

- E** : "Ecological Specificities of the Mediterranean Rim", 2nd and 3rd March 2000, Naples (Italy)
S : "Societies, Territories, Institutions", 15th and 16th December 2000, Torre del Greco (Italy)
C : "Civilisation and Heritage", 8th March 2001, Aix-en-Provence (France)
F : "Training, Research, Raising Public Awareness", 14th and 15th May 2001, Marseille (France)
R : "Risks Threatening Mediterranean Forests and Natural Land Areas, and the Role of Woodlands in Risk Prevention", 8th et 9th June 2001, Valencia (Spain)
O : "Cooperation", 5th November 2001, Marseille (France)
I : Wind-up workshop of the project "The Problem of the Mediterranean Forest", 6th November 2001, Marseille (France)

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