



Spanish Forestry Strategy



MINISTRY OF ENVIRONMENT
SECRETARIAT-GENERAL FOR THE ENVIRONMENT
DIRECTORATE-GENERAL FOR NATURE CONSERVATION



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INTRODUCTION

The world community's growing concern about the environment led to the convening, at the highest level, of the United Nations' Conference on the Environment and Development (UNCED) in Rio de Janeiro in June 1992. Agreements were signed on Climate Change and Biodiversity, but no international agreement was reached in Rio on sustainable forest management. The bases were laid, however, for the subsequent signing of the Convention to Combat Desertification, which was concluded in Paris in 1994 and which opened the way for a consensus on forest matters via the approval of a Declaration¹. Furthermore, Section II, Subsection 11 of Agenda 21 set out the bases to combat deforestation.

At the Special Session of the United Nations Assembly held in New York in June 1997, in which the application of the Rio agreements was appraised, a text was approved that sums up the concern of all countries about the state of the world's forests:

Planning, conservation and sustainable development of all kinds forests are crucial to economic and social development, protection of the environment and the systems that sustain life on Earth. Forests are an integral part of sustainable development.

At the Pan-European regional level, however, it has been possible to work towards a consensus on sustainable forest management through the Ministerial Conferences on Forest Protection. It is expressed in the Resolutions outlined below:^{1bis}

Strasbourg 1990	S1: <i>European Network of Permanent Sampling Plots for Monitoring of Forest Ecosystems</i>
	S2: <i>Conservation of Forest Genetic Resources</i>
	S3: <i>Decentralized European Data Bank on Forest Fires</i>
	S4: <i>Adapting the Management of Mountain Forests to New Environmental Conditions</i>
	S5: <i>Expansion of the EUROSILVA Network of Research on Tree Physiology</i>
	S6: <i>European Network for Research into Forest Ecosystems</i>
Helsinki 1993	H1: <i>General Guidelines for the Sustainable Management of Forests in Europe</i>
	H2: <i>General Guidelines for the Conservation of Biodiversity in European Forests</i>
	H3: <i>Forestry Co-operation with Countries with Transition Economies</i>
	H4: <i>Strategies for a Process of Long-Term Adaptation of Forests in Europe to Climate Change</i>
Lisbon 1998	L1: <i>People, forests and forestry – Enhancement of Socio-economic Aspects of Sustainable Forest Management</i>
	L2: <i>Pan-European Criteria and Indicators and Operational level Guidelines for Sustainable Forest Management</i>

Also, in January 1997, the European Parliament passed a Resolution² on Forest Policy in the European Union, urging the Commission to draw up a European Forestry

¹ U.N.Doc. A/CONF. 151/26 Vol. III

^{1bis} The official translations of the texts of all the Resolutions are in Appendix IX

² A4-0414/96 (DOCE 24/2/97)



strategy within a two-year time limit. In response to this commitment, the Commission has drawn up a report³ which was the subject of a Council Resolution approved in December 1998. Furthermore, in 1998, negotiations were initiated within the European Union on the Rural Development Regulation, which includes support for the forestry sector as part of the package of reforms of the common policies known as Agenda 2000 and which will regulate the aid that will be provided through structural funds for the period 2000 - 2006.

For all the above reasons, Spain should decide on the national forest policy model that is to be followed so that, while simultaneously meeting the above-mentioned international commitments, a Spanish model is implemented that would fit as well as possible with the European model without any detriment to the ever-present need to take into account the special features of Mediterranean forest, as was highlighted in the Final Declaration of the International Conference on the Conservation and Sustainable Use of Mediterranean Forest, Málaga, October 1998^{3bis}

Irrespective of the need to adapt state forest policy to international demands and to clarify the strategy to be followed, in order for Spain to be able to contribute to the formulation of European and pan-European strategies from a sufficient knowledge base, a strategy needs to be drawn up to channel public debate about the distribution of the competencies in matters concerning forest and forest harvesting that is required by the Constitution and the Statutes of Autonomy. National forestry policy, based on the Forest Act of 8 June 1957 and its Regulation, approved by Decree 485/1962 of 22 February, 1962, with slight modifications in Act 5/1977 on Development of Forestry Production of 4 January, was decentralized in the mid-eighties through the approval and implementation of the Royal Decrees on Transfers. Their status and contents are totally insufficient their adjustment to constitutional regulations for the national model to be determined in this matter, as the Constitutional Tribunal has repeatedly pointed out.

By virtue of the Royal Decrees on Transfers, the national Government at least partially retained some management powers in, for example, forest hydrology and measures to combat desertification; co-ordination of forest fire fighting, management of the List of Basic Materials for producing forest reproduction material and the network of Forest Genetic Enhancement Centres, management of the network of indicators of the effects of atmospheric pollution on forests, co-ordination of measures to maintain and restore biological balances, co-ordination to maintain the administrative public records of the Catalogue of Public Utility Forests, the National Forest Inventory, the Forest Map and the national inventories of erosion zones and specially protected areas.

Inclusion of forest policy in the Ministry of Environment since 1996 has left competencies in some fields with the Ministry of Agriculture, Fisheries and Food. These fields are: statistics forest harvesting, plant health, reforestation of agricultural land and, in part, all the activities included in rural development, as well as management of the powers of public spending related with the European Union such as application of the Community

³ COM (1998) (1998) 640 of 18 November. The text appears in Appendix III of this Strategy

^{3bis} The document appears in Appendix X of this Strategy



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EAGGF funds⁴. There is also a lack of definition as to which agricultural or forest policies are applicable, as in the case of *dehesas* (grazing forests), woody crops, forest crops and others, in which the Autonomous Communities have not yet managed to define the policies that are applicable, thereby giving rise to dysfunctions from the point of view of those administered.

All these competencies of the National Administration exist alongside others that have expressly received clearer constitutional or legal support either through Acts or post-constitutional regulations such as the competencies governing livestock tracks, the Committee to Combat Forest Fires or regulating the marketing of forest reproduction material via Constitutional Tribunal verdicts, as in the case of the Catalogue of Public Utility Forests, or via agreements with central government institutions such as that governing hydrological-forest restoration works.

This distribution of competencies within the national Administration and between it and the Autonomous Communities has survived in part due to inertia or, albeit only occasionally effective, has not been reached through a general debate on the forestry sector.

After receiving their competencies, the Autonomous Communities initiated processes of overall forest planning, approving or presenting autonomic forestry strategies or plans, or, in some cases, passing Forest Acts, thereby running the legal risk inherent in departing from the basic state framework currently in force represented by the 1957 Forest Act. Thus, some Autonomous Communities' legislation establishes different regimes for administering and managing public and private forest, or defining forest and other wooded lands in a different way to that laid down in the basic state legislation currently in force. Even the physical conditions to which state and autonomic forest policy applies may, therefore, be different.

Until the Autonomous Communities' acts were passed, public forest policy had been based on the management of public forests. Planning, management and administrative control was applied to privately owned forests subject to consortia or reforestation agreements or to private forests that had been declared as "protection forests". With respect to the remaining private forest land, the task of the public authorities was restricted to administrative control work not really within the realm of overall forest planning. As the private forest sector has matured it is now time to take a fresh look at public policy in that field.

Finally, Spanish society has become more aware over the last ten or twenty years of the beneficial role played by forest land in the balance of nature, and knowledge about the many ways in which it contributes to people's well-being has increased, together with demands for it to be respected in public policy. Forest land must therefore respond to the ecological, social and economic functions that Spanish society demands of it. These functions are outlined below.

ECOLOGICAL FUNCTIONS

⁴ *European Agricultural Guidance and Guarantee Fund.*



- ∕ Regulating the water cycle, protecting land from flooding, spates and snow slides, and helping to improve water quality
- ∕ Halting erosion processes, basically in river basin headwaters
- ∕ Protecting reservoirs from silting up
- ∕ Halting desertification processes
- ∕ Regulating the exchange of atmospheric gases, absorbing harmful gases such as CO₂, fixing carbon and generating oxygen
- ∕ Fixing atmospheric dust and other solids in suspension in the air
- ∕ Safeguarding the biodiversity of forest species themselves
- ∕ Safeguarding the biodiversity of the rest of flora and fauna species
- ∕ Conserving landscape

SOCIAL FUNCTIONS

- ∕ Establishing and stabilising populations, mainly in less-favoured areas
- ∕ Recreation and leisure
- ∕ Educational and cultural uses
- ∕ Generating employment in forestry work and in other types of work, which although not forestry per se, only exist when there are forests
- ∕ Promoting direct and indirect economic activities in less-favoured areas
- ∕ Enhancement of the habitability and ecological development of the neighbouring countryside

ECONOMIC FUNCTIONS

- ∕ Producing goods (timber, fuelwood, resins, cork, pastures for wild and domestic livestock, fruits such as pine nuts, acorns, chestnuts, mushrooms, fungi, etc.) and services
- ∕ Sustainable economic management of the uncultivated countryside per se
- ∕ Contributing to supplying raw materials for an industrial sector.
- ∕ Generating income for the owners of forest property or mixed property



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This multi-functional usage is not sufficiently taken into account in the basic state legislation, which consequently should not only acknowledge it, but also establish the institutional mechanisms and procedures that would guarantee it in every case.

In short, the Spanish Forestry Strategy seeks to offer a new framework from the year 2000. The basic aims are outlined below:

1. Integrate forest land and forest economy into the countryside environment and economy.
2. Balance management of the uses of forest land in accordance with to their many ecological, social and economic functions, ensuring sustainability.
3. Achieve a high degree of co-ordination within the national government and consolidate the constitutional system of distribution of powers between the latter and the Autonomous Communities to avoid duplications and dysfunctions amongst them and to allow planning in the forest sector, both public and private.
4. Implement Spanish forest policy with the criteria and objectives demanded in international and European spheres, always taking into account the special features of Mediterranean forest land, and complement, co-ordinate and support the Autonomous Communities in their own forestry strategies.
5. Provide private forestry operations with an appropriate framework in order to revitalise a sector that is very important for job creation in the countryside.
6. Promote legal, economic and commercial formulae that would allow the restructuring of the forest raw material processing industry, as well as improving marketing.
7. Intensify the protection and defence of forest land against the various agents liable to harm it.

In order to meet the above aims, the Spanish Forestry strategy has been structured in three parts:

- I. Breakdown of the current situation.**
- II. Proposals for a forest policy**, which are structured into:
 - § Structural reforms that must be undertaken in order to implement this Strategy
 - § Planning instrument to articulate more specific strategic objectives.
 - § Industry action, plans or programmes
- III. Application and monitoring of the Spanish Forestry Strategy**

The appendices cover aspects which due to their across-the-board or unique nature must not be omitted any document of this nature.





PART ONE: BREAKDOWN OF THE CURRENT SITUATION

1. FOREST DISTRIBUTION IN SPAIN

Forest land⁵ occupies around 26 million hectares in Spain, representing 51.4 % of the total national land surface of 50,596 million hectares. Due to its size, it plays an essential role in the functioning of the Biosphere, and definitely helps to regulate the water and carbon cycles.

Spain's land classification system, which takes land uses into account, divides land into five major types.

1. Forest land
2. Agricultural land
3. Wetlands
4. Artificial land
5. Bodies of water

⁵ *The definition of forest land in the Forest Land Act of 8 June 1957 currently in force, according to Article 1 of said Act and Article 4 of its implementation provisions of 22 February 1962, is an exclusive concept. Forest land is understood to mean land on which species of tree, thicket, grasses or scrub (matorral) grow, whether spontaneously or as a result of sowing or planting, provided they are not characteristic agricultural species or have been subject to agriculture. This legal definition must be the basic norm according to Article 149.1.23^a of the Constitution because it determines the object that is governed by public policies in this matter and because it delimits the type of land tenure that is subject to forestry legislation.. This exclusive definition of forest land is, however, conspicuously not univocal as some regional governments have defined it differently. Thus, for example, the Forest Acts of Catalonia, Navarra, Andalucia, Valencia, La Rioja and Madrid put forward their own concept of forest land, which departs from crucial aspects of the basic state legislation. Irrespective of this problem, it is true that the reality goes far beyond the legal concepts as, for example, in Spain, land given over to simultaneous agrosilvopastoral use (generically defined as "dehesas") are traditional, but create a certain ambiguity that is difficult to pin down in a legal text. Furthermore, the modern concept of forest land does not take account of use, which is a crucial element in the definition of the 1957 Act, so much as of the functions it fulfils. This is the logical result of a preconstitutional Act, which is to a certain extent obsolete. It seems clear, therefore, that the Forestry strategy must, by means of definitions or descriptions, lay down the physical situations in which it should be implemented and/or those in which it shall be partially implemented.*



According to this classification, which conforms to that applied to Europe in the CORINE LAND COVER Project, forest and other wooded lands includes open and dense forest stands, areas covered by shrubs and/or herbaceous vegetation and open spaces with little or no vegetation.

Forests with a canopy cover of over 20%, occupies 10.7 million hectares, while forest land with thin tree cover occupies 3.2 million hectares according to data from the Second National Forest inventory in 1996. Shrub and/or herbaceous vegetation, along with open spaces with little or no vegetation occupy the remaining 12.1 million hectares and make up the total forest area.

Due to the climatic conditions in Spain, forests, shrubbery stands, herblands and subdesert vegetation occurring in some parts correspond to different structural⁶ types on the Peninsula, the Balearic Islands and Canary Island archipelagos. Intensive human influence in the past has also played a part.

- Stands of hyper-xerophyllous species, especially in parts of the Lower Ebro and the south-east, with non-arboreal or non-forested zonal vegetations, which, in the most mature cases are based on *Pinus halepensis*, *Juniperus thurifera*, *Tetraclinis articulata* or shrubbery of *Quercus coccifera* and *Juniperus phoenicea*.

- sclerophyllous Mediterranean-type forests comprising species of the genera *Quercus*, *Olea* and *Ceratonia*.

- subscleropyllous forests of *Quercus* and *Acer*.

- Mesophilic deciduous forests with predominant species of the genera *Fagus*, *Quercus*, *Prunus* and *Tilia*.

- Forests that could be included as taiga-type, whose main predominant species are of the genera *Pinus*, *Abies* and *Taxus*.

There are also other types of intrazonal areas:

- Freshwater, populated by species of the genera *Betula*, *Alnus*, *Corylus*, *Populus*, *Salix frangula* and *Tamarix*.

- Salt water, with vegetation consisting of *Tamarix gallica*, *Eleagnus angustifolia*, ecotypes of *Populus alba* and acclimated species such as *Phoenix datilifera*.

- Salt water areas where sub-shrubbery predominates.

⁶ Defined on the Forest Map



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- Gypsophilous vegetation, sometimes with *Pinus halepensis*, *Quercus faginea*, *Quercus pubescens*, *Quercus ilex* woodland and a series of shrubs.

- Woodland on sandy soils with pine woods of *P. pinaster* and *P. pinea*, occasionally mixed with open stands of *Juniperus thurifera*, *Juniperus oxycedrus*, *Juniperus phoenicea*, and, on very evolved soils, *Quercus suber*, *Quercus ilex*, *Quercus faginea*, *Quercus pyrenaica*, *Olea europaea* and a diversity of shrubs.

- Stands of rupicolous vegetation and stands on rocky ground on which, depending on whether it is karstic or not, there may be different arboreal, shrub or sub-shrub stands with species such as *Juniperus thurifera*, *Juniperus communis*, *Taxus baccata*, *Pinus uncinata*, *Pinus nigra*, *Fagus sylvatica*, *Corylus avellana* and other species of the genera *Acer*, *Tilia*, *Ulmus* and *Sorbus*.

In the Canary Islands, there are high altitude (alpine) associations that include *Juniperus cedrus* and species of the genera *Viola*, *Cheiranthus*, *Echium* and *Spartocytisus*, laurisilva, *Pinus canariensis* woodland and thermophilic scrub. There are also other intrazonal types similar to those described for the Balearic peninsular region, but consisting of Macaronesian flora.

The main tree species, enriched with a few other species of thicket, may be distributed as follows according to how common and numerous they are in the different tracts

1. Species that are exclusive dominant types:

<i>Abies alba</i>	<i>Quercus faginea</i>	<i>Pinus halepensis</i>
<i>Abies pinsapo</i>	<i>Quercus pyrenaica</i>	<i>Pinus nigra</i>
<i>Pinus sylvestris</i>	<i>Ulmus minor</i>	<i>Pinus pinaster</i>
<i>Pinus uncinata</i>	<i>Quercus suber</i>	<i>Pinus pinea</i>
<i>Fagus sylvatica</i>	<i>Quercus ilex</i>	<i>Populus tremula</i>
<i>Quercus robur</i>	(<i>rotundifolia</i>)	<i>Alnus glutinosa</i>
<i>Castanea sativa</i>	<i>Juniperus thurifera</i>	

2. Species that usually occur as subordinate species or species interspersed in small groups in tracts where other species predominate:

<i>Taxus baccata</i>	<i>Prunus avium</i>	<i>Celtis australis</i>
<i>Acer campestre</i>	<i>Sorbus aria</i>	<i>Quercus canariensis</i>
<i>Acer platanoides</i>	<i>Sorbus aucuparia</i>	<i>Quercus cerroides</i>
<i>Acer pseudoplatanus</i>	<i>Sorbus domestica</i>	<i>Quercus faginea</i>
<i>Acer monspessulanum</i>	<i>Sorbus torminalis</i>	(<i>broterii</i>)
<i>Acer opalus</i>	<i>Sorbus latifolia</i>	<i>Quercus faginea</i>
<i>Acer granatense</i>	<i>Sorbus mongeottii</i>	(<i>alpestris</i>)
<i>Corylus avellana</i>	<i>Tilia cordata</i>	<i>Arbutus unedo</i>
<i>Fraxinus excelsior</i>	<i>Tilia platyphyllos</i>	<i>Laurus nobilis</i>
<i>Fraxinus orrus</i>	<i>Tilia intermedia</i>	<i>Ceratonia siliqua</i>



Olea europaea
Quercus ilex (ilex)
Juniperus oxycedrus

Tetraclinis articulata
Ficus carica
Ulmus glabra

Ilex aquifolium

3. Species that occur in similar density and land cover as pure tracts or mixed and as subordinates:

Quercus petraea
Quercus pubescens
Betula celtiberica

Fraxinus angustifolia
Populus alba
Populus nigra

Salix alba
Salix canariensis

Although in some cases it may be laborious to differentiate the stands of intensive forest harvesting the origin of most of Spain's forest resources, from the remaining tracts, it is important to clarify the basic difference between the two kinds of forest cover.

The former are artificial stands whose role as producers of raw materials determines their structure and simplified composition, as well as their very scant biological diversity. The basic aims of maximum productivity and profitability involve applying intensive forest management that is very far removed from natural ecosystem dynamics. Despite this, management criteria need to be established to avoid environmental conflicts arising due to intensity of use. In Spain, this kind of woodland consists of several species of eucalyptus (*Eucalyptus globulus*, *E. camaldulensis*, *E. nitens*), Monterey pine (*Pinus radiata*), cultivated poplars (*Populus* sp), several kinds of conifers (*Pseudotsuga* sp, *Larix* sp) and cluster or maritime pine (*Pinus pinaster*) treated in short rotation.

Non-intensive forests consist of tree species of natural or artificial origin whose characteristics (structure, species composition, biological diversity) are close to being complex ecosystems. The harvesting systems, where such exploitation exists, make the protection and regulatory function (water, soil, biodiversity, landscape) compatible with forest production.

According to the **type of land tenure**, forest area is divided among the State and the Autonomous Communities, other public bodies, and privately owned forests, as shown in the Figure. As regards land tenure of forest land with tree cover in terms of land surface, the figures are very similar to those for the land surface as a whole. A comparison of these figures with the average for European Union countries reveals that in Spain a remarkably low proportion of land is owned by the Central and the Autonomous Communities Administration, although this imbalance is offset by land owned by other public bodies (local Administration). The figures for private ownership are similar to the European average.

Table 1: Distribution of forest ownership⁷

⁷ National Forest Inventory



Spanish Forestry Strategy

FOREST AREAS BY REGION AND OWNERSHIP

REGION	STATE OWNERSHIP	OTHER PUBLIC OWNERSHIP	PRIVATE OWNERSHIP	TOTAL
ARAGON	1,200,000	1,500,000	300,000	3,000,000
CANTABRIA	1,000,000	1,200,000	200,000	2,400,000
CATALUNYA	1,500,000	1,800,000	400,000	3,700,000
CASTILE AND LEON	1,300,000	1,600,000	350,000	3,250,000
CASTILE-LA MANCHA	1,100,000	1,400,000	300,000	2,800,000
CASTILE AND LEON	1,400,000	1,700,000	400,000	3,500,000
EXTREMADURA	1,200,000	1,500,000	300,000	3,000,000
BALEARES	1,000,000	1,200,000	200,000	2,400,000
BALEARES	1,100,000	1,300,000	250,000	2,650,000
NAVARRA	1,300,000	1,600,000	350,000	3,250,000
VALNCIA	1,400,000	1,700,000	400,000	3,500,000
ANDALUSIA	1,500,000	1,800,000	400,000	3,700,000
ANDALUSIA	1,600,000	1,900,000	450,000	3,950,000
MURCIA	1,200,000	1,500,000	300,000	3,000,000
MURCIA	1,300,000	1,600,000	350,000	3,250,000
REGION OF MURCIA	1,400,000	1,700,000	400,000	3,500,000
REGION OF MURCIA	1,500,000	1,800,000	450,000	3,750,000
REGION OF MURCIA	1,600,000	1,900,000	500,000	4,000,000
REGION OF MURCIA	1,700,000	2,000,000	550,000	4,250,000
REGION OF MURCIA	1,800,000	2,100,000	600,000	4,500,000
REGION OF MURCIA	1,900,000	2,200,000	650,000	4,750,000
REGION OF MURCIA	2,000,000	2,300,000	700,000	5,000,000
REGION OF MURCIA	2,100,000	2,400,000	750,000	5,250,000
REGION OF MURCIA	2,200,000	2,500,000	800,000	5,500,000
REGION OF MURCIA	2,300,000	2,600,000	850,000	5,750,000
REGION OF MURCIA	2,400,000	2,700,000	900,000	6,000,000
REGION OF MURCIA	2,500,000	2,800,000	950,000	6,250,000
REGION OF MURCIA	2,600,000	2,900,000	1,000,000	6,500,000
REGION OF MURCIA	2,700,000	3,000,000	1,050,000	6,750,000
REGION OF MURCIA	2,800,000	3,100,000	1,100,000	7,000,000
REGION OF MURCIA	2,900,000	3,200,000	1,150,000	7,250,000
REGION OF MURCIA	3,000,000	3,300,000	1,200,000	7,500,000
REGION OF MURCIA	3,100,000	3,400,000	1,250,000	7,750,000
REGION OF MURCIA	3,200,000	3,500,000	1,300,000	8,000,000
REGION OF MURCIA	3,300,000	3,600,000	1,350,000	8,250,000
REGION OF MURCIA	3,400,000	3,700,000	1,400,000	8,500,000
REGION OF MURCIA	3,500,000	3,800,000	1,450,000	8,750,000
REGION OF MURCIA	3,600,000	3,900,000	1,500,000	9,000,000
REGION OF MURCIA	3,700,000	4,000,000	1,550,000	9,250,000
REGION OF MURCIA	3,800,000	4,100,000	1,600,000	9,500,000
REGION OF MURCIA	3,900,000	4,200,000	1,650,000	9,750,000
REGION OF MURCIA	4,000,000	4,300,000	1,700,000	10,000,000
REGION OF MURCIA	4,100,000	4,400,000	1,750,000	10,250,000
REGION OF MURCIA	4,200,000	4,500,000	1,800,000	10,500,000
REGION OF MURCIA	4,300,000	4,600,000	1,850,000	10,750,000
REGION OF MURCIA	4,400,000	4,700,000	1,900,000	11,000,000
REGION OF MURCIA	4,500,000	4,800,000	1,950,000	11,250,000
REGION OF MURCIA	4,600,000	4,900,000	2,000,000	11,500,000
REGION OF MURCIA	4,700,000	5,000,000	2,050,000	11,750,000
REGION OF MURCIA	4,800,000	5,100,000	2,100,000	12,000,000
REGION OF MURCIA	4,900,000	5,200,000	2,150,000	12,250,000
REGION OF MURCIA	5,000,000	5,300,000	2,200,000	12,500,000
REGION OF MURCIA	5,100,000	5,400,000	2,250,000	12,750,000
REGION OF MURCIA	5,200,000	5,500,000	2,300,000	13,000,000
REGION OF MURCIA	5,300,000	5,600,000	2,350,000	13,250,000
REGION OF MURCIA	5,400,000	5,700,000	2,400,000	13,500,000
REGION OF MURCIA	5,500,000	5,800,000	2,450,000	13,750,000
REGION OF MURCIA	5,600,000	5,900,000	2,500,000	14,000,000
REGION OF MURCIA	5,700,000	6,000,000	2,550,000	14,250,000
REGION OF MURCIA	5,800,000	6,100,000	2,600,000	14,500,000
REGION OF MURCIA	5,900,000	6,200,000	2,650,000	14,750,000
REGION OF MURCIA	6,000,000	6,300,000	2,700,000	15,000,000
REGION OF MURCIA	6,100,000	6,400,000	2,750,000	15,250,000
REGION OF MURCIA	6,200,000	6,500,000	2,800,000	15,500,000
REGION OF MURCIA	6,300,000	6,600,000	2,850,000	15,750,000
REGION OF MURCIA	6,400,000	6,700,000	2,900,000	16,000,000
REGION OF MURCIA	6,500,000	6,800,000	2,950,000	16,250,000
REGION OF MURCIA	6,600,000	6,900,000	3,000,000	16,500,000
REGION OF MURCIA	6,700,000	7,000,000	3,050,000	16,750,000
REGION OF MURCIA	6,800,000	7,100,000	3,100,000	17,000,000
REGION OF MURCIA	6,900,000	7,200,000	3,150,000	17,250,000
REGION OF MURCIA	7,000,000	7,300,000	3,200,000	17,500,000
REGION OF MURCIA	7,100,000	7,400,000	3,250,000	17,750,000
REGION OF MURCIA	7,200,000	7,500,000	3,300,000	18,000,000
REGION OF MURCIA	7,300,000	7,600,000	3,350,000	18,250,000
REGION OF MURCIA	7,400,000	7,700,000	3,400,000	18,500,000
REGION OF MURCIA	7,500,000	7,800,000	3,450,000	18,750,000
REGION OF MURCIA	7,600,000	7,900,000	3,500,000	19,000,000
REGION OF MURCIA	7,700,000	8,000,000	3,550,000	19,250,000
REGION OF MURCIA	7,800,000	8,100,000	3,600,000	19,500,000
REGION OF MURCIA	7,900,000	8,200,000	3,650,000	19,750,000
REGION OF MURCIA	8,000,000	8,300,000	3,700,000	20,000,000
REGION OF MURCIA	8,100,000	8,400,000	3,750,000	20,250,000
REGION OF MURCIA	8,200,000	8,500,000	3,800,000	20,500,000
REGION OF MURCIA	8,300,000	8,600,000	3,850,000	20,750,000
REGION OF MURCIA	8,400,000	8,700,000	3,900,000	21,000,000
REGION OF MURCIA	8,500,000	8,800,000	3,950,000	21,250,000
REGION OF MURCIA	8,600,000	8,900,000	4,000,000	21,500,000
REGION OF MURCIA	8,700,000	9,000,000	4,050,000	21,750,000
REGION OF MURCIA	8,800,000	9,100,000	4,100,000	22,000,000
REGION OF MURCIA	8,900,000	9,200,000	4,150,000	22,250,000
REGION OF MURCIA	9,000,000	9,300,000	4,200,000	22,500,000
REGION OF MURCIA	9,100,000	9,400,000	4,250,000	22,750,000
REGION OF MURCIA	9,200,000	9,500,000	4,300,000	23,000,000
REGION OF MURCIA	9,300,000	9,600,000	4,350,000	23,250,000
REGION OF MURCIA	9,400,000	9,700,000	4,400,000	23,500,000
REGION OF MURCIA	9,500,000	9,800,000	4,450,000	23,750,000
REGION OF MURCIA	9,600,000	9,900,000	4,500,000	24,000,000
REGION OF MURCIA	9,700,000	10,000,000	4,550,000	24,250,000
REGION OF MURCIA	9,800,000	10,100,000	4,600,000	24,500,000
REGION OF MURCIA	9,900,000	10,200,000	4,650,000	24,750,000
REGION OF MURCIA	10,000,000	10,300,000	4,700,000	25,000,000
REGION OF MURCIA	10,100,000	10,400,000	4,750,000	25,250,000
REGION OF MURCIA	10,200,000	10,500,000	4,800,000	25,500,000
REGION OF MURCIA	10,300,000	10,600,000	4,850,000	25,750,000
REGION OF MURCIA	10,400,000	10,700,000	4,900,000	26,000,000
REGION OF MURCIA	10,500,000	10,800,000	4,950,000	26,250,000
REGION OF MURCIA	10,600,000	10,900,000	5,000,000	26,500,000
REGION OF MURCIA	10,700,000	11,000,000	5,050,000	26,750,000
REGION OF MURCIA	10,800,000	11,100,000	5,100,000	27,000,000
REGION OF MURCIA	10,900,000	11,200,000	5,150,000	27,250,000
REGION OF MURCIA	11,000,000	11,300,000	5,200,000	27,500,000
REGION OF MURCIA	11,100,000	11,400,000	5,250,000	27,750,000
REGION OF MURCIA	11,200,000	11,500,000	5,300,000	28,000,000
REGION OF MURCIA	11,300,000	11,600,000	5,350,000	28,250,000
REGION OF MURCIA	11,400,000	11,700,000	5,400,000	28,500,000
REGION OF MURCIA	11,500,000	11,800,000	5,450,000	28,750,000
REGION OF MURCIA	11,600,000	11,900,000	5,500,000	29,000,000
REGION OF MURCIA	11,700,000	12,000,000	5,550,000	29,250,000
REGION OF MURCIA	11,800,000	12,100,000	5,600,000	29,500,000
REGION OF MURCIA	11,900,000	12,200,000	5,650,000	29,750,000
REGION OF MURCIA	12,000,000	12,300,000	5,700,000	30,000,000
REGION OF MURCIA	12,100,000	12,400,000	5,750,000	30,250,000
REGION OF MURCIA	12,200,000	12,500,000	5,800,000	30,500,000
REGION OF MURCIA	12,300,000	12,600,000	5,850,000	30,750,000
REGION OF MURCIA	12,400,000	12,700,000	5,900,000	31,000,000
REGION OF MURCIA	12,500,000	12,800,000	5,950,000	31,250,000
REGION OF MURCIA	12,600,000	12,900,000	6,000,000	31,500,000
REGION OF MURCIA	12,700,000	13,000,000	6,050,000	31,750,000
REGION OF MURCIA	12,800,000	13,100,000	6,100,000	32,000,000
REGION OF MURCIA	12,900,000	13,200,000	6,150,000	32,250,000
REGION OF MURCIA	13,000,000	13,300,000	6,200,000	32,500,000
REGION OF MURCIA	13,100,000	13,400,000	6,250,000	32,750,000
REGION OF MURCIA	13,200,000	13,500,000	6,300,000	33,000,000
REGION OF MURCIA	13,300,000	13,600,000	6,350,000	33,250,000
REGION OF MURCIA	13,400,000	13,700,000	6,400,000	33,500,000
REGION OF MURCIA	13,500,000	13,800,000	6,450,000	33,750,000
REGION OF MURCIA	13,600,000	13,900,000	6,500,000	34,000,000
REGION OF MURCIA	13,700,000	14,000,000	6,550,000	34,250,000
REGION OF MURCIA	13,800,000	14,100,000	6,600,000	34,500,000
REGION OF MURCIA	13,900,000	14,200,000	6,650,000	34,750,000
REGION OF MURCIA	14,000,000	14,300,000	6,700,000	35,000,000
REGION OF MURCIA	14,100,000	14,400,000	6,750,000	35,250,000
REGION OF MURCIA	14,200,000	14,500,000	6,800,000	35,500,000
REGION OF MURCIA	14,300,000	14,600,000	6,850,000	35,750,000
REGION OF MURCIA	14,400,000	14,700,000	6,900,000	36,000,000
REGION OF MURCIA	14,500,000	14,800,000	6,950,000	36,250,000
REGION OF MURCIA	14,600,000	14,900,000	7,000,000	36,500,000
REGION OF MURCIA	14,700,000	15,000,000	7,050,000	36,750,000
REGION OF MURCIA	14,800,000	15,100,000	7,100,000	37,000,000
REGION OF MURCIA	14,900,000	15,200,000	7,150,000	37,250,000
REGION OF MURCIA	15,000,000	15,300,000	7,200,000	37,500,000
REGION OF MURCIA	15,100,000	15,400,000	7,250,000	37,750,000
REGION OF MURCIA	15,200,000	15,500,000	7,300,000	38,000,000
REGION OF MURCIA				



Table 2: Main tree species⁹

MAIN TREE SPECIES IN SPANISH FORESTS			
CONIFERS WITH LARGEST COVER		('000 hectares)	
Species	Dominant	Co-dominant with others	Total
<i>Pinus pinaster</i>	1.058	626	1.684
<i>Pinus halehalepensis</i>	1.365	135	1.500
<i>Pinus sylvestris</i>	840	370	1.210
<i>Pinus nigra</i>	525	338	863
<i>Pinus pinea</i>	223	147	370
<i>Juniperus thurifera</i>	124	83	207
<i>Pinus uncinata</i>	75	0	75
<i>Pinus canariensis</i>	72	0	72

BROADLEAF SPECIES WITH LARGEST COVER		('000 hectares)	
Species	Dominant	Co-dominant with other species	Total
<i>Quercus ilex</i>	1.473	503	1.976
<i>Fagus sylvatica</i>	343	105	448
<i>Quercus pyrenaica</i>	313	68	381
<i>Quercus suber</i>	117	256	373
<i>Quercus faginea</i>	88	181	269
<i>Castanea sativa</i>	102	111	213
<i>Quercus robur/Q. petraea</i>	38	171	209
<i>Olea europaea</i>	17	58	75

2. FACTORS AFFECTING THE STRUCTURE AND DISTRIBUTION OF SPANISH FORESTS

2.1. NATURAL FACTORS

The natural factors determining forest structure and distribution are geographical situation, relief, altitude, orientation, slope, climate and soil.

Geographical situation is an important determining factor in forest composition. As a general rule, the number of co-dominant tree species is high in latitudes near the Equator, decreasing as latitude decreases to the one single-species stands found at high latitudes, for example, boreal conifer forests. Spain's position in the temperate zone, which corresponds to its average latitude, gives rise to intermediate structures in which different stands can coexist such as multiple species stands of broadleaves, conifers or mixed, with one single –species broadleaved or conifer stands as can be seen in the tables and figures on spatial distribution given below.

⁹ National Forest Inventory



Relief is an essential factor in forest composition. The way the mountain ranges are arranged was decisive in allowing or impeding the spread of forests. Transversal west to east orientation, as in Spain and a large part of Europe, was an obstacle, but longitudinal north to south orientation, as in North America and Asia, was not. This explains why in the temperate zone and at equal latitudes, there is more mixed woodland on the American or Asian continents than in Europe, with a larger number of co-dominant species.

Altitude, orientation and slope are integral features of relief, and play an important role in the composition of Spanish woodland. As a general rule, low altitudes, valley layout and north-facing slopes favour species co-dominance, especially in deciduous broadleaves, e.g. the *fragas* of Galicia. In contrast, slope layout and high altitude characterise one single-species stands, such as the beech forests of Navarra and the pine forests of the inland mountain ranges of the Iberian Peninsula. Altitude and slope are directly related with the proportion of forest area. In Spain, forests cover over 50 % of the land surface up to an altitude of 800 metres; this proportion is over 70 % at 1,000 metres, 84 % at 1,200 metres and over 90% from 1,400 metres, and this rising trend continues up to the timber-line.

In Spain, 75% of the forest area with tree cover has a slope of over 12%. The slope is over 20% in 60% of the forest area and more than 35% in 35% of said area.

Altitude	1,000 Ha	Proportion	1,000 Ha	Proportion
0-199	7 359	7.60%	13 614	71.64%
200-399	7 517	13.92%		
400-599	4 207	15.75%		
600-799	4 453	17.14%		
800-999	4 393	16.91%		
1 000-1 199	7 319	12.77%	7 379	28.36%
1 200-1 399	1 845	7.10%		
1 400-1 599	1 384	4.17%		
1 600-1 799	655	2.52%		
1 800-1 999	231	0.90%		
> 2 000	236	0.91%		
TOTAL	25 934	100.00%	25 934	100.00%

Table 3: Altitude of forest areas¹⁰

Climate is another factor determining forest composition. In general, areas with mild temperatures, little temperature variation between the seasons and high and regularly distributed precipitation are the most liable to have co-dominant multiple-species stands. These characteristics mainly occur at the north-west end of the Peninsula and, to a somewhat lesser extent, in the basin of the Western Pyrenees, gradually decreasing towards the south-east, where the opposite conditions prevail. The Balearic Islands are in an intermediate situation although closest to that of the south-east of the Peninsula. In the Canary Islands, there is an almost continuous transition from the wet west of La Palma island to the dry east of Fuerteventura.

¹⁰ National Forest Inventory



Soil type also favours or restricts the spread of forests. Whether the land is siliceous or limestone, clayey or sandy, rich or poor in salts, determines the distribution and spread of forest species. Rich deep soils are obviously the most suitable for the growth of forest vegetation although they are the most at risk of being converted for agriculture.

2.2. NON-NATURAL FACTORS: HUMAN ACTIVITY

The impact of human activity on vegetation goes back further than is normally supposed. When the great plant migrations took place after the last great glaciation, people were already having an impact on forests. Nowadays, only relict examples remain of vegetation that is close to its natural state, as people have continually interfered with it since first appearing on the Earth.

2.2.1. Deforestation

Human impact on the vegetation has always been directly related to its accessibility. Harsh relief is a factor that delays or deters exploitation. Large ranges with many divides and narrow winding valleys are more liable to conserve tree cover and substrates of scrub and grassland. Vegetation that has hardly been altered is only found in areas with very rugged terrain.

Invasions, wars, revolutions and crises brought about by epidemics, scarcity and migrations brought about alternating changes in cover over large areas, with changes between dry-farming crops, grasslands and shrubs. Nowadays, in many parts of the country, shrubbery can be seen advancing over slopes with former terracings for dry-farming crops.

Setting fires to facilitate hunting is one of the oldest kinds of destructive action on forests, affecting both mountainous and flat land. The subsequent expansion of livestock brought with it regular fires to regenerate pasture land, a practice which is still often used inappropriately. The spread of agriculture and establishment of stable settlements initially eradicated forest cover in the valleys, fields and plains, and this deforestation continued when population growth increased the need to obtain food in intermediate areas of less agricultural value and soft relief.

State intervention itself, following the political directives imposed by circumstances in each period, has had repercussions on forest. Thus, naval building policy affected oak woodland above all, which was often wiped out, and also the best pine forests. Mining also left its mark on forest cover in almost all Spain's mountain ranges. The dissolution of forest land in the nineteenth century affected all kinds of forest, but more extensively broadleaved stands because the final uses to which it was put -charcoal making or agriculture- were more destructive, particularly the latter, which involved the best land. Only official cataloguing in the nineteenth century managed to reduce the destructive effect of dissolution, although in



part, as over all of Europe, forest recovery was due both to initiatives by the forestry administration and to socio-economic changes which, linked to the upsurge in industry, allowed a reduction in pressure on forest as a source of energy and as reserve land should agricultural needs increase. Finally, in the twentieth century, for reasons of agrarian reform, not only was arbitrary complete ploughing legitimised, but agriculture was even permitted on Public Utility Forests

2.2.2. Forest recovery in Spain

So much and such continued encroachment on forest only began to be halted from the middle of the nineteenth century by means of its cataloguing, which managed to save a lot of very valuable forest from disappearing by keeping it within the public domain and prevented the furs, “*pinabetes*”, *Spanish fir*, *pinus*, *junipers*, *yews*, *beech*, *chestnut*, *alder*, *birch*, *oak*, *Pyrenean oak*, *Portuguese oaks*, *holly and broom* and forest land whose sale was dubious and was, as a result, subject to prior inspection, *cork oak woodland*, *holm oak*, “*mestizales*” and *holly oak woodland*¹¹ from changing hands.

The 1877 Act on the Improvement and Reforestation of Public Forest Excluded from Dissolution, which made it obligatory for 10% of forestry income to be devoted to replanting and improvement and suitable silviculture to be applied, initiated reconstruction of tree cover and reversed the trend towards regression in forest cover. The process was reversed from then on with the setting up in 1901 of the Hydrological-Forest Divisions, the passing of the Act of 24 of June of 1908 on protective or buffer woodland, the Act of 9 October 1935 creating the State Forest Heritage and the drawing up in 1939 of Spain’s National Plan for Reforestation.

Within about 40 years after 1940 over three million hectares were replanted in Spain. The work done by the State Forest Heritage at that time had its successes and failures, good and bad points, which have left their mark on the Spanish countryside in the form of either exemplary measures and reforestation or as assaults on, and ill-advised management of, the forest heritage.

The use of pine species is justified by the fact they are frugal, xerophilous and pioneers in the potential progress of vegetation. Helyophilous, light demander and pioneering tolerance they can grow in deteriorated and poor soils and withstand prolonged droughts and extreme temperatures, all very positive characteristics for initiating the recovery of the deteriorated areas where they were used. They sometimes had good results and sometimes bad. Some of today’s best forests are the result of those years of reforestation, and the hydrological restoration works often prevent intense erosion.

Forests covered in mature natural stands were inappropriately valued by managers. Traditional livestock uses were also damaging. Fire, long present in Spanish forests, was often the tool of a kind of agriculture obliged to convert pastureland and shrubbery into

¹¹ *Forest Land Act of 1863. The List of Institutional Forest Land was drawn up in 1862*



reforestations. The imperatives of a period marked by self-sufficiency, an authoritarian administration and absence of planning led to mistakes which must now contribute to improvement in the future.

Analysis of the reforestation carried out between 1945 and 1985 reveals that 84% of the land surface with tree cover was public property and the remaining 16% private property. Reforestation on land without tree cover accounted for 67% of land surface, while the rest corresponded to reforestation on clearings or areas that had been felled or burnt. In contrast to the distribution of forest property in Spain, according to which 66% of the land surface is privately owned, the low percentage of reforestation on private land is no doubt due to the unfavourable contract conditions for private owners of the consortia stipulated in the National Forest Heritage Act of 10 March 1941. Even so, reforestation of public and private land by consortia also caused problems regarding the financial balance of the investments made at that time. The problems that have since come to light raise the need to pardon the debts that have been accrued or to review the financial formulae.

Reforestation with short rotation species is worth a special mention given the alternative of producing forest products while respecting the forest species with the most ecological requirements and the greatest environmental value. That kind of reforestation was carried out for the most part by private individuals along the Cantabrian belt and by the paper industry both there and in the south-west of the Peninsula, with less than 20% being done by the State. The broadleaved species *Eucalyptus sp.* and *Populus sp.* and the conifers *Pinus radiata* and *Pinus pinaster* were used. Eucalyptus stands mainly spread in the north-west and south-west of the Peninsula, while poplar stands extended along riversides, especially in the Basque Country, and pine sites in the Cantabrian belt, especially in Galicia. Unfortunately, the eucalyptus plantations also spread in ecologically valuable areas such as Monfragüe and Doñana where they should never have been allowed. The land surface covered by these reforested areas currently amounts to about 1,300,000 hectares distributed as follows: 500,000 hectares of *Pinus pinaster*, 500,000 hectares of *Eucalyptus sp.*, 200,000 hectares of *Pinus radiata* and 100,000 hectares of *Populus sp.* As for *Pinus pinaster*, the inland areas reforested with this species have not been taken into account as they do not have what may be regarded as rapid growth characteristics. At low and medium altitudes, the Cantabrian climate has mild temperatures, no great summer droughts or intense winter cold, and high precipitation, even in summer. These conditions favour rapid-growth species and growth levels are achieved there that are unknown in other areas with similar characteristics, but with fewer hours of light and lower average temperatures.

The current Royal Decree 378/1994, modified by Royal Decree 152/1996 of 2 February, which sets out an aid scheme to promote forest investment in agricultural farmings and the development of forest harvesting in rural areas, the transposition of the European legislation, has meant an important step forward in the process of restoring forest land status to areas that were deprived of that status in the past in order to establish farming land that was often marginal. Furthermore, the restrictions imposed on Spanish livestock by the European Union could mean changes in use over large areas of the Cantabrian belt, with current livestock use changing to forest use by simply abandoning grasslands and sometimes even by introducing plantations with rapid-growth and short rotation species, promoting what



has recently been termed “forest crops”, which make up for the loss of income of agriculturists and livestock farmers who have had recourse to EU schemes.

2.2.3. Shrubbery and grassland

Shrubbery is an important part of forest, alternating more or less profusely with tree species, and the different kinds of scrub play an important role in forest ecosystems. They are undoubtedly of interest in many respects including their ecological significance and the amount of land they cover. In addition, they are part of the diet of Spain’s domestic and wild animal species, provide them with cover and shelter and used as raw material for diverse products that are widely used.

In the typical kind of shrubbery found on forest in Spain, three kinds of developmental stages in plant cover can be distinguished and, as a result, three kinds of action can be taken.

There is a kind of shrub whose protection and propagation will improve the survival of the existing development stage, by at least ensuring that the regression process is detected. Conservation is one of the most vital functions of this scrub.

There are other kinds which are the remains of previous stages, far from optimal, and so it is important to defend and spread them because they greatly enrich and enhance the whole. They may be classed as edifying.

Finally, there is shrub consisting of frugal hardy species corresponding to stages of greater deterioration, inclined to invade by taking advantage of circumstances that aggravate seasonal conditions. This scrub consists of destructive species.

By analysing the characteristics and type of vegetation, grasslands and shrubberies, two large discontinuous areas are discernible in Spain: cold Spain of the high mountains, with rain in winter but no marked dry period in the growing period; and dry Spain with a long dry period lasting three to five months, which occurs when yearly temperatures are at their highest.

- Alpine grassland

Located in areas over 2,000 metres, with a cold climate and snow lasting five or six months, and with short summers without long periods of drought. Annual precipitation exceeds 600 mm. Storms are common in summer.

The vegetation is characterised by the absence of tree species due to the lack of warmth in the short growing period and by the large numbers of stunted shrubs and perennial herbaceous thickets covering the ground. The woody species include *Juniperus communis*.



Var. Nana, *Cytisus purgans* and *Rhododendrum ferrugineum*, and the associated herbaceous species include *Agrostis rupestris*, *Festuca supina*, *Carex curvula* and *Luzula lutea*.

They are seasonally productive grasslands restricted to the summer months and valid for seasonally migrating livestock, which have to leave them when the bad weather starts.

- Atlantic-Central European grasslands

Areas with mild summers during which rain is more or less common and with winters that are mild to cold, but never very cold.

Depending on the altitudes and soils in these areas there are forests of beech (*F. sylvatica*), common oak (*Q. robur*), sessile oak (*Q. petraea*), also conifers such as mountain pine (*P. uncinata*), Scots pine (*P. sylvestris*), black pine (*P. nigra*) and silver fir (*A. alba*); in the driest parts there are Pyrenean oak (*Q. pyrenaica*) and white oak (*Q. pubescens*), and even cork oaks (*Q. suber*) at the wettest end of its distribution area.

In these forests, the soil is more or less sodded to clearings or bare land that has not been overrun by *Genista*, *Adenocarpus*, *Cytisus*, *Ericas* and *Ulex* shrub that occurs with that kind of tree association. In clearings or where the woody cover disappears, grass species overrun the ground and Atlantic-Central European grasslands form.

The distribution of these associations is quite broad; they occur between 1.000 metres altitude and the lower edge of the alpine grasslands. There are two notable large areas: Atlantic grasslands situated in the lowlands of Galicia and the Cantabrian belt, and those situated in the montane and subalpine pine forests of the Pyrenees, Cantabrian-Asturian Mountains, Galaic Massif, Iberian System, Central System, Marianic and Oretana Systems and the Penibetic System.

- Mediterranean grasslands

They occur in the areas with Mediterranean climate, i.e. in areas with a predominance of mild or quite cold, but never very cold, winters, and long summers with high temperatures and hardly any rain, with a long summer dry period.

In these conditions, sclerophyllous forests of holm oaks (*Q. Ilex*) form. There are Cork oaks (*Q. suber*) and Portuguese oak (*Q. faginea*), and forests of stone pine (*P. pinea*), Aleppo pine (*P. halepensis*) or maritime pine (*P. pinaster*) and juniper woodland (*Juniperus phoenicia* and *J. sabina*) The characteristic scrub consists of very typical species such as *Pistacia lentiscus*, *Arbutus unedo*, *Teucrium fruticans*, *Retama sphaerocarpa*, *Ulex parviflorus*, and on degraded soils there are *Cistus ladanifer*, *Cistus crispur*, *Lavandula latifolia*, *Lavandula pedunculata*, *Santolina rosmarinifolia*, *Erica umbellata* and *Erica australis* and *Genista scorpius*.

These areas are suitable for small livestock such as sheep or goats, depending on the kind of vegetation, but the animals cannot be left in the summer unless they are provided



with supplementary fodder. This group of grasslands includes the notable *dehesas* or *montes adeshados* (savannah-like grassland) that are vitally important in the rural culture of much of Spain.

2.2.4. Protected Natural Areas

Spain is a mountainous country that hosts representations of four biogeographical regions (Alpine, Mediterranean, Atlantic and Macaronesian), which means that there is a great variety of woodland types. Management of these types as regards conservation and enhancement has moved towards protection of highly valuable ecosystems.

The first protection category of these natural areas at national level appeared in 1862 when the List of Forest Land Excluded from Dissolution was created. It was the origin of what is today known as the List of Public Utility Forest Land, which includes just over 10.000 plots of forest land and covers nearly 6.5 million hectares.

PROTECTED NATURAL AREAS		
PROTECTION STATUS	Number	Surface area
National park (state network)	11	220 227
Natural park	81	973 071
Nature reserve	75	44 930
Natural site	34	86 230
Other	402	851 968
TOTAL	603	3 188 325

Table 4: Protected areas¹²

Apart from the listed forest land, it may be said that the network of protected natural areas in Spain really got underway in 1916 with the National Parks Act. Covadonga Mountain (16.567 Ha.) and the Ordesa Valley (2.351 Ha.) were declared as national parks on the basis of that Act. Since then, the changes in numbers and extension may be classified chronologically in three periods: from 1918 to 1979, from 1980 to 1988, and from 1989 to the present.

Between 1918 and 1979 the network of protected natural areas grew very slowly, only reaching 27 and some 200.000 hectares of land by the end of that period.

After 1980, the year that marked the start of the process of the transfer of competencies in nature conservation matters to the Autonomous Communities, a second period got underway in which the declaration of protected natural areas was initiated, reaching 150 by the end of 1988 and approximately 750.000 hectares.

However, the most notable increase in the network took place after the passing of the first regional act (Catalonia, in 1985) and especially after 1989, when Act 4/1989 of 27

¹² National Forest Inventory



March on Conservation of Natural Areas and Wild Flora and Fauna was passed. It is enough to cite as an example that in 1989 the number of areas grew by nearly 100 units and surface area increased by over a million hectares, the size of most of Andalucía. From then on, there has been a continuous increase in the network of protected natural areas. The current figures are over 3.000.000 hectares, approximately 6% of the country's land surface and around 600 protected natural areas in over thirty different protection categories.

In absolute terms, the autonomous community with the largest surface area of protected land is Andalucía, with just over 1.500.000 hectares, a figure that amounts to virtually half the protected surface area of Spain as a whole. It is followed by the Canary Islands with just over 350.000 hectares and Castilla y León with 270.000 hectares.

In proportion to its geographical surface area, the autonomous community with the largest percentage of protected land is the Canary Islands with nearly 43%, followed by the Balearic Islands with 39% and Andalucía with approximately 18%. 12%, 23% and 65% of land tenure in the protected natural areas in the country as a whole belongs to the State, other public bodies and private owners, respectively.

A large part of the natural areas declared as protected area are associated with Public Utility Forest land, protection forests or forestry land. This is indicative of, and reinforces, the idea that good forest management involves not only production, but also nature conservation.

The concepts and functions that natural areas carry out have varied substantially in recent years, as have the functions associated with forest land. The latter has become the subject of a host of initiatives for nature protection models and for the implementation of new models of sustainable land management.

Although not yet completed, introduction of the European Union's Natura 2000 Network into Spain is imminent. When the definitive list of Sites of Community Interest (SCIs) is ready, areas aspiring to be Special Conservation Areas as component parts of the European network, which will include the Special Protection Areas for Birds (SPAs), a large part of the land planned to be included in that Network will be areas that can be classed as forest land so determination of the management instruments for them that are compatible with the Network should be clarified in the short term.

Finally, a more detailed description of those areas and of the policy to be followed can be found in the Spanish Strategy on the Conservation and Sustainable Use of Biological Diversity, which was approved by the Environment Sector Conference on 1 December 1998.

2.2.5. Livestock routes

To a certain extent, livestock tracks, along which seasonal migration has taken place since the Middle Ages, can also be regarded as protected areas. Nowadays, although seasonal migration (transhumance) has almost disappeared, they have become specially important and



Act3/1995 of 23 March tries to safeguard them as being crucial for the migration, geographical expansion and genetic exchange of wild species. These routes cover 125.000 kilometres and an estimated land surface of about 420.000 hectares throughout Spain.

The publication in 1999 of Number 24 in the Series “Seasonal Migration (Transhumance) Notebooks” (Andía/Urbasa/Encía) completes the series of 25 issues that ICONA began in 1992. It is the most complete historical, legal, geographic and descriptive study of the nation’s livestock tracks and the most significant areas for seasonal migration, and includes an evaluation of their importance and current scope. That same year a complete map of the national network was published in compliance with Act 3/1995.

3. FOREST USES

As indicated in the Introduction, the forest territory and economy, in the broadest sense of the word, are an integral part of the rural environment and economy. There are no preferred types of exploitation but instead, all the types of multifunctional use are of equal value, a priori, in making their small contribution to the socio-economic development of the rural environment. In fact, a serious study of the contribution of the sector to the overall Spanish economy has yet to be carried out. Furthermore, such a study might have little meaning if it is made precisely in the moment in history when the systems of national accounting are in the process of radical change in order to incorporate the environmental as a factor.

Considering a wide range of sources (which are already out of date with respect to variables and methodology, but are used nevertheless), the calculation of what may be supposed to be the forestry sector as a whole is being carefully studied by an international consultancy¹³ and their results will soon see the light of day.

The Ministry of Agriculture, Fisheries and Food offers the following account:

AGRICULTURAL MACROMAGNITUDES SILVICULTURAL PRODUCTION FIGURES At current prices (millions of pesetas)	
<i>1997 (Provisional)</i>	
Timber from Coniferous Trees	67 422.4
Timber from Deciduous Trees	41 523.0
TOTAL TIMBER	109 015.4
fuelwood	7 742.8
Total timber and fuelwood	116 758.2

¹³ Study by PriceWaterhouse Coopers



Resin	206.1
Cork	5 913.8
Seeds	4 726.4
TOTAL OTHER PRODUCTS	10 906.3
REAFFORESTATION (Contracted work)	14 368.9
FINAL SILVICULTURE PRODUCTION	142 033.4

Other sources provide the following figures:

Product	Value¹⁴ (Millions of €)
Timber	621
fuelwood	56
Cork	58
Acorns	112
Chestnuts	7
Pine nuts	1
Truffles	4
Mushrooms	50
Pastures	412
Game*	171
River Fishing *	27

* Only the value of the pieces collected, which constitutes the smallest part of the total for these sectors, is considered.

Of course, it is enough to examine the variables in these tables to see that further studies are needed to give a full picture. Only very recently have studies begun to become popular that employ the up to date methodology that is generally accepted in the world of economics, such as the contingency method or other similar methods that bring official accounting into line with real accounting.

€ In the field of forestry we should highlight the studies calculating the contribution of the Mediterranean forests to the income related to the well-being of society¹⁵. These include those carried out by TRAGSATEC for various Autonomous Communities¹⁶ and those

¹⁴ Madrigal, A., Fernández Cavada, J.L., and Ortuño S.F., *The Forest Sector in Spain (1999)*

¹⁵ Pablo Campos Palacio, *La Contribución del Monte Mediterráneo, el Bienestar de la Sociedad, Conferencia Internacional sobre Conservación y Uso Sostenible del Monte Mediterráneo, Benalmádena (Málaga), 28-31 October 1998.*

¹⁶ *The model developed by TRAGSATEC includes two important novelties:*



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1.- Each forested hectare of the territory is valued. It is not a matter of valuing a particular ecosystem or place with special characteristics. On the contrary, all parts of the territory are valued from the point of view of all aspects that have economic value.

2.- The methodology for application to a computerized cell model has been designed, using the cell size required by the territory (usually 1 hectare). This condition allows a regional thematic map to be produced to a planning scale (1:50 000 to 1:200 000).

Given the substantial quantity of information that has to be considered, the model has been developed on a GIS (Geographic Information System) platform, e.g., the forested area of the Community of Madrid is 389 220 ha and the model includes 14 maps and 16 tables with almost 500 attributes in order to estimate the 13 coverages that describe the economic value of the region.

Methodology: The different items produced by the ecosystems have been grouped by three aspects in order to value them:

1.- Productive aspect. They are broken down into separately valued elements: timber, firewood, fruit, pastures, hunting, cork, fishing, wind, etc. The potential production of each hectare is estimated and valued at the market rate (using the mechanics of the Analytical Method, but with public discount rate). The total income from this item is obtained by aggregating the elements that yield the greatest income in each cell, subject to the incompatibilities that exist among them. The value, as for the other aspects, is obtained by capitalization of this infinite flow of incomes with an STPR. It is neither meaningful nor possible to value all the aspects in all territories.

2.- Recreational aspect. Two elements are distinguished: the value of the recreational areas and the value of the landscape (forested environment). For the first element the Journey Cost Method is used, generalised in the areas in which the influx is not known, with the variables that define their attractive (hedonistic) capacity. The second element is valued by the Hedonistic Prices Method (in which the landscape is an explanatory element of the land value of the municipalities), or by separating the part attributable to the diffuse use of the territory (when the users and non-users exhibit different aptitudes) from the Aptitude To Pay (ATP), obtained by the Contingent Evaluation Method.

3.- Environmental aspect. This aspect incorporates elements of use (CO₂ fixation, prevention of avenues, soil protection, etc.) and non-use (values of existence, option, donation and bequest). Of the elements of use, only CO₂ fixation has been valued up to now, because it is unique for those who have a territorial model of behaviour for the entire territory at their disposal; it is valued by the Avoided Costs Method comparing the fixation produced by current ecosystems with the costs of reforesting a mass that would fix the same quantity of CO₂. The non-use value, which has not proved possible to break down into elements, is valued for the entire territory by the Contingent Evaluation Method (following the protocol demanded by the Blue-Ribbon Panel), separating, where necessary, the part of use that is internalised (landscape). The superficial share of the overall value obtained is calculated as a function of an Environmental Quality index, as defined for each territory to be valued by a panel of environmental experts.

Status of the Evaluation Projects undertaken by TRAGSATEC (May 1999)

- | | |
|--------------|--|
| June-95 - | Comprehensive Economic Evaluation of the Forest Ecosystems of the Community of Madrid, Project ECOVAL. This is an independent project. |
| January-98 - | Comprehensive Economic Evaluation of the Forest Ecosystems of the Balearic Islands. This is a subproject within the General Forest Fire Defence Plan (does not include evaluation of the recreational aspect). |
| April-98 - | Comprehensive Economic Evaluation of the Forest Ecosystems of Tenerife. This is a subproject within the General Forest Fire Defence Plan. |



corresponding to the evaluation of profits derived from the Protection of Natural Spaces¹⁷.

Finally, recognising the multifunctionality of the forests, it is a logical consequence to admit that it is a sector that produces positive externalities such that any accounting system that does not include them goes against the logic of the markets themselves.

With these provisos, we go on to diagnose the situation with respect to the distinct manners of exploitation of primary, secondary and tertiary forest.

3.1. TIMBER USES

Although it represents the greatest percentage of forest income the exploitation of timber is not the only type of economic exploitation in most of Spain, which is characterised by its Mediterranean and continental climate.

The exploitation of forest products, in general, and those derived from timber, in particular, has been carried out in such a manner that the continued existence of the resources has always been assured, providing direct economic benefits to society at the same time. The amount of tree felling has oscillated between 14 and 15 million cubic metres with bark in the last ten years, showing a small but sustained increase. Approximately 60% of the timber comes from coniferous trees, and 40% from deciduous trees.

The forest-industrial chain yields about 2 billion pesetas annually, supports more than 200 000 jobs, exports 338 000 million pesetas and imports 653 000 million pesetas, of which 100 000 million come from round timber or sawn timber, in other words, the raw material of the sector¹⁸.

-
- December-98- *Comprehensive Evaluation of the Conservation of Biodiversity in the Autonomous Community of Navarra. This is an independent project, and includes values for non-use by ecosystem and species.*
 - June-99 - *Integral Economic Evaluation of the Forest Ecosystems of Cadiz and Malaga. These are two independent projects.*
 - September-99 - *Integral Economic Evaluation of the Protected Spaces of the Canaries. This is an independent project.*
 - September-99 - *Integral Economic Evaluation of the Forest Ecosystems of the Autonomous Community of La Rioja. This is a subproject within the General Forest Fire Defence Plan.*

¹⁷ Luis Pérez, Jesús Barreiro, Tamón Barberán and Salvador de Saz, *El Parque Posets-Maladet (Economic approximation of recreational value) 1998*; Jesús Barreiro, *Evaluation of benefits deriving from protection of natural areas: the case of Ordesa national Park (1999)*

¹⁸ Data from the Ministry of Industry and Energy



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The stumpage for Spanish forests overall amount to about 600 million cubic metres and the annual growth in barked timber-yielding volume is around 30 million cubic metres.

Comparing the figures corresponding to the growing stock and mean increment with the volume felled, it may be seen that these amount to 2.5% of the stocks and 50% of the annual increase of timber-yielding volume, by which and with respect to this activity, the principle of the continued existence of the forest stands is, in principle, assured.

Timber yield, considered to be the most important forest product because of its economic value, shows a clear growth trend, due to the expansion of reforested areas with new plantations and the improvement of the existing forest stands, which has been occurring in recent years. Current yield is less than our consumption, accounting for only 60% of our requirements, and although the loggings have increased, so has our consumption (Tables 6, 7 and 8).

	GROWTH IN VOLUME			
	Stocks		Growth	
	1 000 m ³	%	1 000 m ³	%
CONIFEROUS	363 323	61.15	17 550	58.31
DECIDUOUS	230 795	38.85	12 530	41.69
TOTAL	594 118	100	30 080	100

Table 5: Tree growth¹⁹

The accurate evaluation of the production of the forests would require the calculation of the annual yield capacity, mainly of timber, of each one. However, as this information is not available for all forests, production has to be taken as being equivalent to the extraction of timber made each year, as cited in the Agricultural Statistics Yearbook.

¹⁹ *Agricultural Statistics Yearbook*



SPECIES	m. with c/c	VALUE IN THOUSANDS OF PESETAS	
		Standing	Stored
CONIFERS			
Pinus pinaster	11 526 271	3 375 601	1 141 317
Pinus radiata	256 877	1 122 100	11 724 000
Quercus ilex	2 079 867	1 126 650	22 110 200
Abies alba	206 276	401 075	1 117 474
Other conifers	2 172 000	566 050	126 820
TOTAL CONIFERS	5 241 391	6 591 476	26 226 811
DECIDUOUS			
Alfalfa	216 426	1 126 000	1 226 000
Castor	176 750	225 500	1 045 000
Castano	12 000	20 000	1 100 000
Fraxinus	1 136 000	2 426 000	15 700 000
Fagus	150 000	2 400 000	6 100 000
Other deciduous	112 000	500 000	26 000 000
TOTAL DECIDUOUS	3 803 602	12 747 500	37 271 000
TOTAL CONIFERS AND DECIDUOUS			
9 044 993			
Timber for graining and other industrial uses			
		1 126 000	1 700 000
Unclassified and outside forests			
		2 426 000	10 000 000
TOTAL TIMBER			
		3 552 000	11 700 000

Table 6: Timber production by species. 1997²⁰

YEAR	TOTAL CONIFERS AND DECIDUOUS (total in m. c/c):			Timber for graining and industrial uses	Unclassified and outside forest	TOTAL TIMBER (m. c/c)
	Private forest	Total forest	Proport on private			
1974	3 557 377	8 802 575	63.33%	641 990	1 719 160	11 163 725
1977	4 659 213	7 561 519	61.45%	743 344	4 839 016	13 163 879
1980	4 799 736	7 961 306	62.64%	940 873	3 289 318	11 891 527
1983	5 470 944	8 373 718	65.33%	625 489	2 290 534	11 286 751
1985	6 530 590	9 870 701	66.16%	1 209 631	4 504 618	15 634 880
1989	8 224 461	11 030 504	75.63%	775 606	3 947 129	15 753 290
1992	7 860 898	10 376 824	76.70%	474 624	3 220 33	14 074 081
1995	9 023 941	12 717 912	77.24%	232 310	2 620 077	15 573 299
1996	9 269 123	11 922 926	77.99%	244 829	2 570 540	14 729 303
1997	10 170 815	13 092 296	77.75%	193 654	2 377 890	15 653 920

Table 7: Balance of national consumption of timber and firewood

It may also be said that this is the sector in which there is the greatest possibility for development, as it is where there is the most land available for reforestation with medium and high productivity (rapid growth), as long as their location is adequate, and also where forest improvement that helps to increase production may be carried out. Both measures contribute to the protection of slow-growing species that produce better quality timber.

²⁰ Agricultural Statistics Yearbook



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YEAR	TOTAL CONIFERS AND DECIDUOUS (felled in m ³ C/C)			Timber for grinding and industrial uses	Unclassified and outside forest	TOTAL TIMBER (m ³ C/C)
	Private forest	Total forest	Proportion private			
1974	5 557 077	9 802 575	60 13%	641 960	1 719 160	11 160 725
1977	4 669 213	7 981 919	61 46%	743 344	4 839 319	13 169 873
1980	4 798 708	7 881 308	62 84%	840 877	3 789 349	11 891 527
1983	5 470 944	8 372 718	66 33%	926 488	2 286 934	11 286 751
1986	6 530 593	9 676 721	66 16%	1 208 531	4 554 548	15 634 863
1989	9 234 461	11 331 504	83 53%	775 565	3 947 129	15 753 299
1992	7 960 899	10 379 824	76 70%	474 524	3 220 933	14 074 081
1995	9 853 941	12 717 912	77 24%	232 311	2 653 377	15 573 299
1996	9 259 323	11 323 926	77 99%	244 823	2 570 548	14 739 333
1997	10 179 615	13 392 286	77 75%	183 854	2 277 890	15 652 830

Table 8: Timber production. Time series^{21,22}

These data reflect the importance of the private forestry sector with respect to total timber production, and how this proportion has increased in recent years. Timber prices have a notorious influence on the annual volume of extractions, in such a way that they increase when they are favourable to the owner, and decrease during times of economic crisis, when the prices fall.

In the future, it is likely that the securing of timber will depend largely on plantations and agroforestry systems, and in particular on the plantations of rapid growth species, which will be exploited more extensively. At the same time less recourse will be made to natural stands which will be managed in accordance with longer felling rotations, with the aim of obtaining high quality timber. However, there will also be a wide range of other items and cultural and social facilities, which will thereby, on one hand, reduce the national timber deficit, and on the other, reduce the pressure for extraction from natural forests.

The following graph shows how the increase in timber consumption is giving rise to a parallel increase in importation, while steady production is maintained, to the detriment of the balance of trade.

²¹ *Agricultural Statistics Yearbook—provisional figures*

²² *Agricultural Statistics Yearbook*

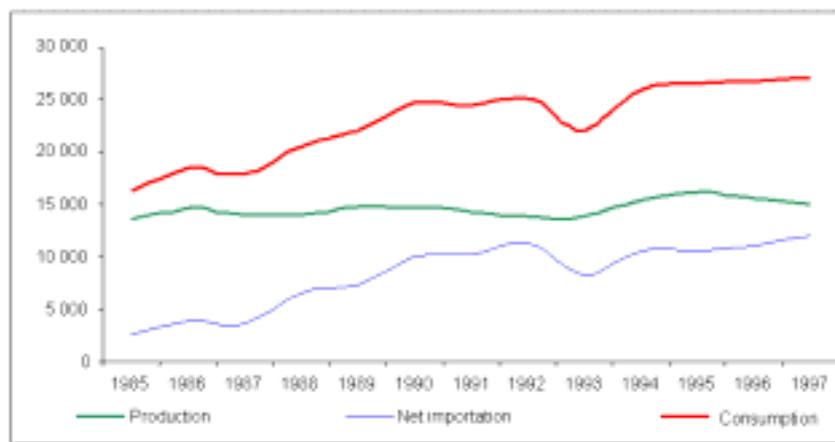


Figure 2: Timber and firewood market

The production and sale of timber and the other forest products will be increasingly influenced by the implementation of the certification of origin from sustainable forests. This will be reflected in a type of ecological labelling, increasingly demanded by the consumer, and that will affect the possibilities for export and consumption of our timber and other forest products.

Rapid-growth conifers, almost all of them in the Cantabrian Mountain Range, account for approximately 12% of the national area afforested with conifers, but correspond by volume to more than 60% of the felling of this type of timber. Rapid-growth deciduous trees account for approximately 13% of the national area afforested with deciduous trees, although this represents a volume of more than 75% of the annual felling of timber in this class. Overall, the rapidly growing species occupy approximately 12% of the country's afforested area, but by volume provide 68% of the annual timber felled.

The apparent consumption of timber and fuelwood, taken as the balance between extraction and importation on one hand, and exportation on the other, exceeds 25 million cubic metres annually. If the current trend continues then this deficit will increase in the coming years, as may be deduced from an analysis of national consumption over the years. Since the five-year period 1980-84, in which the average annual deficit was about 3 million cubic metres, this has continued increasing, reaching about 5 million cubic metres in 1985-89, and doubling to 10 million cubic metres in 1990-94.



Spanish Forestry Strategy

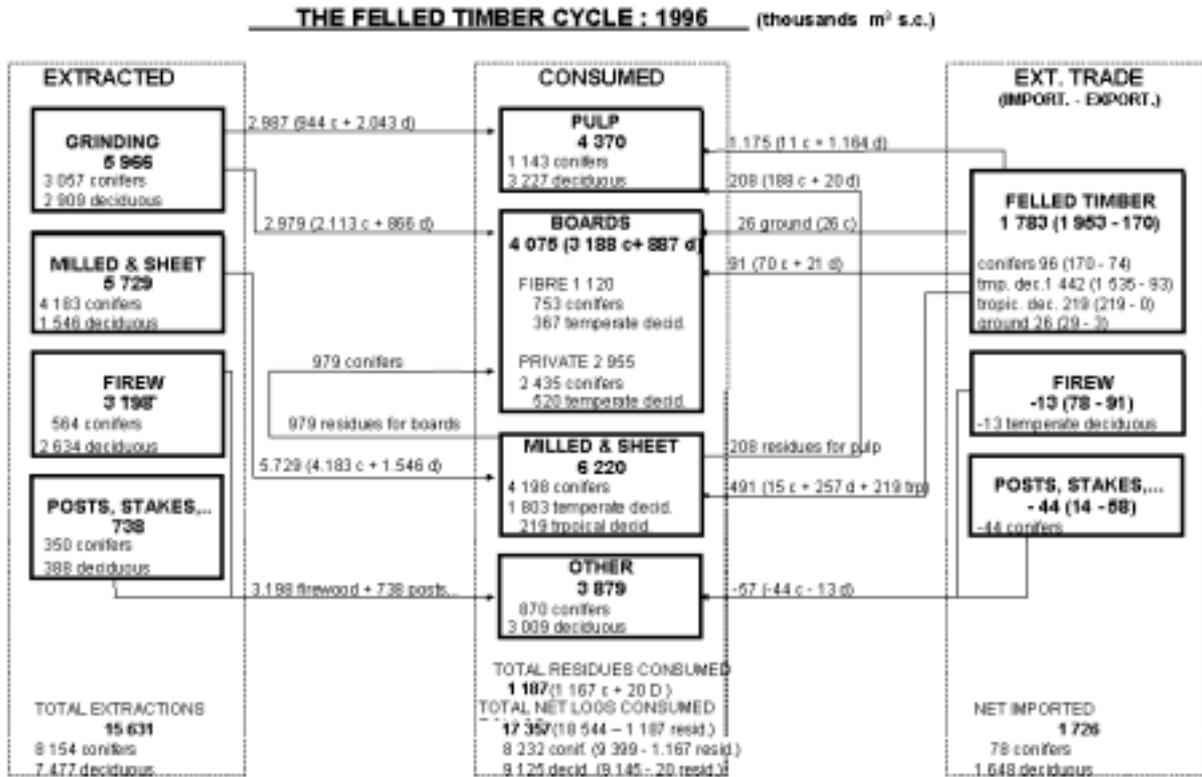


Figure 3: Rough timber circuit²³

It is important to point out that, according to the quoted data, half of the timber produced by the Spanish forest masses as a whole is used, or in other words, scarcely 50% of what may be considered to be potentially exploitable. This implies that the productivity of Spanish forests is much less exploited than it potentially could be.

This excessive prudence is even more significant in the context of the progressive commercial deficit in forest products, in Spain and the European Union, and the pressure that is consequently put upon countries with tropical forest, from which a large part of the consumption that developed countries do not produce is extracted.

Spain has a deficit in round timber and its derived products, as may be seen in the adjoining diagram of the timber cycle. The situation tends to be aggravated since the rates of consumption predicted for the coming decade are increasing, for which reason it needs to be analyzed whether it is advisable to increase national production if it is wished to satisfy the needs of consumption. This could be easily achieved by increasing the number of jobs, forest exploitation and reforestation with rapidly growing species, as long as their location is adequate - in abandoned agricultural areas, for example.

²³ MINER figures



Meanwhile, despite the fact that the level of exports of derived products is high, the balance of foreign trade for timber and primary derivatives is negative, reaching 92 168 million pesetas in 1996. Finally, the consumption of round timber per inhabitant per year is currently of the order of 0.32 m³ of round timber and the round timber-equivalent of sawn timber and boards, which is less than the average community consumption (0.51 m³/inhabitant/year), for which reason there is still great potential for growth in consumption.

According to 1996²⁴ figures, the timber for industrial use comes from:

a) round timber

- Extracted: 12 443 thousand m³ without bark
- Net imported: 1 713 thousand m³ without bark

b) Ground timber:

- Imported: 26 000 thousand m³

c) Milled timber and sheets:

- Imported: 1 816 thousand m³ of milled timber and 47 000 thousand m³ of sheet.

Round timber has two main uses:

- Timber for grinding: 7 232 thousand m³
- Timber for milling and sheets: 6 220 thousand m³

The remainder of the industrial round timber, which is used for posts, stakes etc., constitutes a small amount: 694 000 m³.

Milled timber is used by the carpentry and furniture sector, and complements national production. As consumption is 3 080 thousand m³, imports account for 59% of the demand for timber used for these purposes.

Timber for grinding is distributed among the cellulose pulp (4 162 thousand m³) and chipboard sheet and fibre (3 096 thousand m³) industries. In addition, these industries are supplied with residues from other industries, mainly timber mills, by which they meet part of their requirement of 8 445 thousand m³. This demand is distributed as follows: 4 370 m³ to the pulp industry and 4 075 thousand m³ to the sheet industry. The imports of round timber for grinding and ground timber reach 1 292 thousand m³, i.e., 15.3% of timber needs.

Additionally, independently of the above, it may be confirmed that from the industrial point of view, there are not many specific safety regulations in the timber sector, although all installations must comply with the general regulations that apply in all industrial establishments. However, there are a large number of UNE regulations concerning quality, covering raw timber and that processed for use in parquets, doors, sheets and structures for building.

²⁴ Ministry of Industry and Energy



3.2. GRASSLAND USAGE

The broad concept of grasslands is the reason why it is very difficult to arrive at a classification of these lands based on their uses, in which the exact area that is genuine grassland is precisely established. This difficulty is very acute in Spain, as there are large areas given over primarily to agricultural production or to timber-yielding forest, and which are only grazed at the end of the year for longish periods.

The Ministry of Agriculture, Fisheries and Food's 1995 Agricultural Statistics put the area dedicated to pastureland at 7 006 million ha, although around 20 million ha are temporarily grazed in Spain. The difference between the two figures stems from the areas classified in this Statistic as land for cultivation and forest lands that are in fact grazed.

PASTURES AND FIELDS			
NATURAL	Cut	Tonnes hay	3 279 151
FIELDS	Pastured	Live weight meat	133 635
Grassland		Live weight meat	124 060
Open forest		Live weight meat	95 000
Wooded forest		Live weight meat	56 435
Unfilled pasture		Live weight meat	55 201

Table 9: Pasture & grassland usage²⁵

It is difficult to quantify the production of our pasturelands as they are consumed in situ by the livestock and wild fauna without estimates ever having been made previously. The production of pastureland in animal products can theoretically be measured, but it is also difficult in practice to obtain figures that reflect the number of animals that are fed exclusively under a grazing regime and the number of months that this is practised at the end of the year, since a good part of our livestock live under a regime of semi-stabling or complete stabling.

The exploitation of our pasturelands consists almost entirely of grazing. Grass is only cut and gathered from highly productive meadows, and these scarcely exceed 600 000 ha. The grass from these is fed to the livestock either fresh, or more usually, transformed into hay, silage or meal.

From the above we may conclude that a significant and greater part of the forest area has historically exploited livestock. 54.39% of the area is made up of natural meadow, pastures, untilled land used for pasture, and open woodland. However, this conclusion becomes of even greater importance if we consider that an important part of timber-yielding forests is habitually used for livestock farming.

²⁵ *Agricultural Statistics Yearbook 1996*



3.2.3. Grazing

Extensive livestock farming needs an adequate physical environment to enable its development. Thus it is essential for there to be a space that can provide the natural resources necessary for this activity. This extensive farming is characterized by the need for a minimum infrastructure and by the exploitation of natural resources to feed the animals. Therefore, it is one of the activities that has least impact on the natural habitat and that most respects the environment. Neither accommodation nor other buildings for livestock that might have a negative effect on the landscape are necessary, nor complicated systems to bring water to wherever the livestock are, as they themselves move to natural water courses.

Furthermore, natural resources are used that would otherwise be underused, and occupy particular spaces that would not otherwise be of any use.

Additionally, the use of grass, pastures, meadows, grasslands and other mountainous areas avoids the need to use animal fodder and other types of products for feeding animals.

Therefore, extensive livestock farming uses spaces that in most cases cannot be used for the pursuit of other activities. It is completely impossible to draw up a forest policy, in the broad sense of the term, without considering the use and exploitation of grazing as the most important activity in the forest environment, at least in terms of the area used.

In the Spanish case, land-based livestock farming has a purpose of production that is intimately linked with the typically environmental conservationist parameters, as exemplified by the reduced incidence of grazing per unit area, even in the non-timber-yielding forests. Currently, livestock farming, as with agricultural and Forest Activity, cannot be organized from a purely productive point of view. Other new factors of increasing importance also have to be taken into consideration, as has been shown in the new reforms of the CAP²⁶, which, in the context of the European agricultural model, includes the following characteristics, amongst others:

- € An agriculture with healthy methods of production, that respects the environment, and is capable of providing high quality products that meet society's expectations.
- € An agriculture that is rich and diverse in its traditions, and whose mission is not only to produce but also to conserve the natural environment and employment in the rural environment.

The importance of extensive livestock farming, i.e., that using afforested land for feeding, is shown by a consideration of the censuses and farms that currently exist.

²⁶ *Common Agricultural Policy*



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Livestock associated with the area				
LIVESTOCK	TOTAL		Non-milking livestock (extensive)	
	N° HEAD	N° FARMS	N° HEAD	N° FARMS
Cattle	5 992 877	107 700	1 628 186	39 500
Sheep	24 357 069	80 000	14 336 737	58 300
Goats	3 753 714	-	-	-

Other livestock associated with the area		
LIVESTOCK TYPE	TOTAL (heads/beehives)	MOTHERS
Pigs extensive	945 887	70 364
Horses	260 000	-
Donkeys	60 000	-
Mules	90 000	-
Number of beehives	1 954 171	-

Table 10: Livestock census²⁷

3.2.3.1. Beef cattle

The Spanish beef cattle production sector is made up of two completely separate subsectors with their own features:

- ∅ The calf production sector (mother cows) whose fundamental objective is the production of calves, which in the terminology of the community are known as nursing cows.
- ∅ The calf-fattening sector.

The geographical distribution of these cows is mainly concentrated in the dry regions of Spain (Andalusia, Extremadura, and Castilla-Leon account for 57% of the census), although there are also very significant populations in Galicia and Asturias (the five Autonomous Communities make up 78% of the total census).

Farming of this type of animal usually occurs over large areas and therefore in obviously extensive regimes, in which their feed is only supplemented with fodder and forage during the hardest winter months. They mainly occupy pasture areas, although they can also be found on grassland in the dry areas and in the natural meadows of the north of the peninsula.

The calf-fattening sector is confined to the regions with high cereal production (Aragon, Catalonia, Castilla-Leon) or in the areas near large urban centres (Toledo). The adverse schismatic conditions of the country have meant that the production of pasture and fodder has been scarce, except in the Cantabrian Mountain Range. This dearth of grazing resources makes it impossible to fatten animals in the field except in specific areas of the wetter parts of Spain and has made it necessary to search for other types of mainly cereal-based resources to feed them.

²⁷ Figures from the Ministry of Agriculture, Fisheries and Food, December 1997



Farming specific premium livestock requires that livestock density be respected in order to qualify for aid, for which reason a relation must be established between the forage areas and the number of animals.

The CMO²⁸ of beef cattle establishes a range of regimes for premiums in its basic regulations, among which are the premium for nursing cows and the special premium. In order to qualify for these, certain limiting conditions have to be fulfilled, as it is necessary to respect particular livestock densities. This obligation was imposed following the modification made in 1992, whose intention was to promote the regimes that had greatest production and respect for the environment. The livestock density that has applied since the 1996 campaign is 2 LLU²⁹/Ha of grazing area for the premium for nursing cows and the special premium for male calves.

In addition, what is known as the extensification premium may be earned by cattle farmers who receive one of the two aforementioned premiums and who farm at a density less than or equal to 1.4 or 1.0 LLU/ha, receiving in the former case 26 Euros per animal with a premium in the former case, and 52 Euros in the latter.

Therefore, to qualify for these premiums, the exploitation of beef cattle has to have a suitable and sufficient foraging area. Such areas are very largely those defined as afforested areas.

In order to gain an idea of the volume that this aid constitutes for the sector it is enough to point out that the data of the Spanish Agrarian Guarantee Fund (SAGF) indicated that 1 399 553 nursing cows received a premium in 1997, of which more than 90% also received some of the premiums for extensification. 79 224 producers received a premium.

With respect to the special premium for male calves, the national limits were reached and more than 70% of the animals with a premium received the supplementary payment for extensification.

In economic terms, and according to the data of the SAGF, Spanish cattle breeders received 36 000 million pesetas in premiums for nursing cows and 13 000 million pesetas for the special premium for the male calves in 1997. The premium for extensification was valued at around 15 500 million pesetas, which attests to the importance of this sector.

In the goat sector the production of meat and milk is usually undertaken in extensive regimes, the income received being 80% of the unitary premium that heavy kids receive.

²⁸ *Common Market Organization*

²⁹ *Large Livestock Unit*



3.2.3.2 Sheep and goats

The sheep standing crop is irregularly distributed throughout the country, 80% of it being concentrated in five of the seventeen Autonomous Communitys (Castile and Leon, Castile-La Mancha, Aragon, Extremadura and Andalusia).

The goat population is mainly confined to Andalusia, Castile-La Mancha, Extremadura and the Canaries. These make up 73% of the total.

Sheep and goat farming for milk is characterized by the maintenance of a semi-extensive exploitation regime, while sheep and goat rearing for meat is carried out under an extensive regime, albeit in a very different manner from that followed in past times when wool was the main reason for the existence of some sheep breeds. The orientation towards meat production as the main activity and the need to increase productivity in order to meet the growing costs of exploitation of the flock have imposed a more favourable system than in the past.

In any case, pastures are the principal food source of these livestock. They are grazed almost every day of the year, and only very adverse climatic conditions or certain moments in their production or reproduction are cause for the animals to be kept in fold.

The seasonality of Spanish pastures requires a search for means of supplementing feeding. In some cases, recourse is made to transhumance or to shorter displacements to make use of pastureland, or else animals receive fodder and/or hay in folds

Under the regime of the premiums that are applied to the sheep-goat sector, no conditions for density have been introduced since the regimes of exploitation are usually fairly extensive, above all for sheep farmed for meat, while dairy sheep are usually farmed under a semi-extensive regime. The CMO for meat from sheep and goats annually fixes a premium for loss of income as a function of the average registered prices in the Community. A premium is also conferred for the offspring of sheep and goats in disadvantaged areas of the Community.

3.2.3.3. Extensive pig farming

Nowadays in some regions, such as Andalusia, pig livestock are mainly fed in the countryside taking advantage of the mast of oak forests and „dehesas,” as this is of fundamental importance. However, in other regions they are fed mainly under a regime of stabling, and so the incidence of pastures in their feeding is minimal.

The standing crop of extensive pig livestock is mainly distributed in Andalusia (55.7%) and Extremadura (25.7%), although animals are also found in Castile and Leon and Castile-La Mancha.



Extensive pig farming is exclusively localized in areas of “dehesa”, under a regime of farming in which natural resources (grass, acorns and other fruits) are used to feed the animals. Only under particular regimes are cereals employed in the final feed.

It is thus a matter of having the type of production that respects the natural environment and yields high additional value. In fact, there are three Guarantees of Origin associated with the products derived from these animals: those of ham from Huelva, Guijelo and Dehesa de Extremadura. The latter was ratified by the OM of the Ministry of Agriculture, Fisheries and Food on 2 July 1990. In all cases animals must belong to breeds that can only be exploited under an extensive regime and that are fed on a diet based mainly on “dehesa” products.

3.2.3.4. Apiculture

Another use of the forests, albeit a seasonal one, is the maintenance of beehives. Apiculture is a profitable activity that can be conducted alongside agricultural, forestry and livestock activity. Bees have a special impact because of their influence on the economy and in rural development, and in general in nature, due to their pollination role, which is fundamental to the ecological balance of forest plant species and the increase of yields of those cultivators involved in food production.

Bee-keeping has become a part of the agricultural-livestock sector and as such the Community Regulations 1221/97, of 25 June, 2228/97 of the Commission, of 18 November, and those of 2000/97 of the Commission, of 20 November, exist in which the application of the regulations of the former are set out.

The general regulations for the application of the varieties destined to improve the production and marketing of honey are established through the Community Regulations.

Recently, through Royal Decree 519/1999 of 20 March, the regime of aid to beekeeping has been regulated within the framework of the annual national programmes.

Bee-keeping in Spain has always occupied an important place among the activities undertaken in forest areas. Currently, according to the 1996 data, the number of beehives exceeds 1.85 million, counting moveable and fixed hives. The yield of honey and wax were 27 312 and 1 747 metric Tonnes, respectively, in that year.

The Autonomous Community of Castile-La Mancha, as an example of a region where this activity is pronounced, has around 1 400 beekeepers and 142 000 beehives operating throughout all of its provinces, according to the data of the Marchamalo Regional Centre for Apiculture³⁰.

³⁰ *Agricultural Council, 1996*



The average yield is 15 kg of honey/bee hive/year, which amounts to a production of 1 500 kg. It is estimated that 80% of the beekeepers surveyed have fewer than 100 hives, placing a commercial value of 375 000 ptas/year on the product. These gross incomes are insufficient to maintain the activity and should be taken to represent an additional income.

Although it is considered as a use, it has certain features that confer on it a character of occupation: hives are situated on the land for a short period, occupying a physical space and another of influence. These are not fixed from one year to the next, nor may their location be determined in advance for inclusion in the annual plans since they depend on the abundance of plants and the quantity of flowers from which bees extract nectar.

The National Apiculture Programme, jointly financed by Spanish Administrations and the European Union is the framework in which consistency is given to the public dealings concerning this matter.

As in the former case, it is a matter of a type production that respects the natural environment and that does not require much infrastructure, that is undertaken over wide areas of the dry regions of Spain and that provides a use for particular areas of limited exploitable value.

There is a Guarantee of Origin for the honey from Alcarria, which supports the production of this specific area and guarantees the quality of its production.

3.2.4. Importance of livestock grazing in forest areas

3.2.4.1. Conservation of forest areas

Livestock farming is an activity that has made rational use of the forest lands since time immemorial and has contributed decisively to their conservation.

It should not be forgotten that livestock management that only places importance on premiums per head of livestock or production quotas can lead to an intensification of the use of the forests and other wooded lands that provokes dysfunctions. For example, forest fires may be a consequence of the search for pastures for wandering livestock (especially in Autonomous Communities such as Galicia). There are many examples that illustrate the point made in the previous paragraph, but the party with the greatest interest in the conservation of natural resources and the prevention of their deterioration and possible destruction ought to be the livestock farmers themselves if they are encouraged to make the appropriate of the livestock burden on the forest ecosystems.

The livestock farmer will take advantage of the resources provided by the land, needing them principally for feeding livestock. This will be a decisive influence on the quality of what is produced.



In many cases it is the livestock farmer himself who takes on the responsibility for the improvement of the pastures and grasslands, and is the person who best understands their circumstances. He may even stop grazing in certain areas if necessary so that the vegetation can recover.

The role that livestock plays in the fertilization of the soil is beyond doubt. They provide a substantial quantity of organic material, which would be impossible to supply in any other form, and so considerably enrich the soil. As well as allowing the balanced provision of nutrients, by progressively producing the mineralization of this organic material, it also leads to an improvement in soil structure.

Another positive aspect is the elimination of the shrubbery by animals that feed on it, as if this is not cleared it can favour the spread of forest fires.

Additionally, the aim of the livestock farmer to maintain plant cover avoids the substantial risks of erosion and desertification, and the consequent losses of useful soil, which are unfortunately so serious in Spain.

3.2.4.2. Stabilizing the rural population

For decades, the main problem facing the Spanish countryside has been the depopulation of the rural areas. Such factors as the scarcity, high cost and lack of suitability of the labour, in conjunction with the difficulties and competitiveness of national and international trade, and low productivity, have contributed to this.

This decrease, which began in the 19th century, motivated by the aforementioned factors, led to emigration to the large cities and the abandonment of agricultural and livestock farming activities.

The various agricultural policies developed in recent years favour the modification of this tendency, with aid and measures that encourage settlement in the rural environment. Livestock are a key element in this process.

Cattle and sheep constitute alternative livestock, capable of providing foodstuffs of prime quality, of achieving a return on pastures over broad areas of Spain, including those in which the relief and climate are unfavourable, of favouring the settlement of families in areas in danger of depopulation and of lending indispensable aid for the protection and conservation of numerous rural spaces.

The improvement in the quality of life of the population of these areas, the modernization of the uses, the increase in productivity, amongst other objectives, will foster the balancing of the level of income of livestock farmers in these areas with those of workers and farmers in other sectors. This will allow the revaluation of a large part of the forest area. This will have to be achieved fundamentally through the exploitation of extensive livestock farming.



Livestock farming encourages the settlement of families in areas where it is difficult to start up other activities. It provides jobs, mainly in family businesses that depend on incomes obtained from the sale of livestock products.

It is certain that livestock farming is one of the best means of giving new value to substantial areas of the Spanish countryside, as long as a rigorous policy of livestock extensification is adopted.

3.2.4.3 Maintaining local breeds

CATALOGUE OF CATTLE, SHEEP, GOAT, PIG AND HORSE LIVESTOCK BREEDS³¹

1. INDIGENOUS BREEDS	
1.1. PROMOTED	
Cattle species	Asturiana de los Valles, Avileña Negra Ibérica, Lidia, Morucha, Pirenaica, Retinta and Rubio Gallega
Sheep species	Castellana, Churra, Lacha, Carranzana, Manchega, Merina, Navarra, Rsa Aragonesa, Ripollés and Segureña
Goat species	Caprina Canaria Group, Malaqueña, Murciana-Granadina and Verata.
Pig species	Ibérica
Horse species	Horses: Española
1.2. SPECIALLY PROTECTED	
Cattle species	Albera, Alistana-Sanabresa, Asturiana de la Montaña, Berrenda en Negro, Berrenda en Colorado, Betizu, Bruna de los Pirineos, Blanca Cacereña, Cachena, Caldelana, Canaria, Cárdena Andaluza, Frieresa, Limiana, Mallorquina, Menorquina, Monchina, Murciana-Levantina, Negra Andaluza, Pajuna, Palmera, Serrana Negra, Sayaguesa, Vianesa, Terreña and Tudanca.
Sheep species	Alcarreña, Aranesa, Ansotana, Canaria, Canaria de Pelo, Cartera Castellana (black variety), Colmenareña, Chamarita, Churra Lebrijana, Churra Tensina, Gallega, Guirra, Ibicenca, Maellana, Mallorquina, Manchega (black variety), Menorquina, Merina (black variety), Merina de Grazalema, Montesina, Ojalada, Ojinegra de Teruel, Palmera, Roja Mallorquina, Roja Bilbilitana, Rubia del Molar, Sasi Ardi, Talaverana, Xalda and Xisqueta.
Goat species	Mesetas Group, Azpi Gorri, Blanca Andaluza or Serrana, Blanca Celtibérica, Bermeya, Del Guadarrama, Florida, Gallega, Ibicenca, Jurdana, Mallorquina, Moncayo, Negra Serrana, Pirenaica, Payoya and Retinta.
Pig species	Negra Canaria, Celta, Chato Murciano and Negra Mallorquina
	Horses: Asturcón, Burguete, Gallego de Monte, Hispano-Arab, Hispano-Bretón, Jaca Navarra, Losina, Mallorquina, Menorquina, Monchina and Pottoka.
	Donkeys: Andaluza, Asno de las Encartaciones, Catalana, Mallorquina, Majorera and Zamorano-Leonés
2. SPANISH BREEDS	
Cattle species	Charolesa, Fleckvieh, Frisona, Limusina and Parda
Sheep species	Berrichon du Cher, Fleischschaf, Ile de France, Landschaff, Merina Precoz and

³¹ Spanish Strategy for the Conservation and Sustainable Use of Biological Diversity



	Charmoisa
Pig species	Duroc, Hampshire, Landrace, Belgian White, Large White and Pietrain
Horse species	Horses: Anglo-Arab, Arab, English Thoroughbred and Trotador Español

BREEDS IN DANGER OF EXTINCTION³²

AUTONOMOUS REGIONS	SPECIES				
	CATTLE	SHEEP	GOATS	PIGS	HORSES
Andalusia	Berrenda en Negro Berrenda en Colorado Cárdena Andaluza Mostrenca Negra Andaluza, Pajuna	Churra Lebrijana Merina de Grazalema Montesina	Blanca Andaluza Blanca Serrana Florida Jurdana Negra Serrana (or Castila) Payoya		Hispano-Arab
Aragón	Serrana Negra	Ansotana Cartera Churra Tensina Maellana Ojinegra Roja Bilbilitana	Moncayo Pirenáica		
Asturias	Asturiana de Montaña				Asturcón
Balearics	Mallorquina Menorquina	Ibicenca Mallorquina Menorquina Roja Mallorquina	Ibicenca Mallorquina	Negra Mallorquina	Mallorquina Menorquina
Canaries	Canaria Palmera	Canaria Palmera		Canaria	
Cantabria	Monchina Tudanca				Monchina
Castile and Leon	Alistana-Sanabresa	Castellana (black variety) Ojalada			Hispano- Breton Losina
Castile- La Mancha		Alcarreña Manchega (black variety)	Agrupación de las Mesetas Blanca Celtibérica		
Catalonia	Albera Bruna de los Pirineos	Xisqueta			
Extremadura	Blanca Cacereña	Merina (black variety)		Retinta	
Galicia	Cachena Caldelana Frieiresa Limiana Vianesa	Gallega	Gallega	Celta	Gallego del Monte
Madrid		Colmenareña Rubia del Molar	Cabra del Guadarrama		
Murcia	Murciana				
Navarra	Betizu	Aranesa			Burguete Jaca Navarra
Basque Country	Terreña				Pottoka
La Rioja		Chamarita			
Valencia		Guirra			

The intensive livestock farming systems designed to yield the maximum individual productivity associated with the greatest efficiency in the processing of foodstuffs has meant a

³² Document prepared by the Ministry of Agriculture, Fisheries and Food



reduction in the number of breeds and the decrease of intrabreed genetic variation. Likewise, the economic value of the breed has been destroyed, in favour of the strain, for specific ends.

Thus the scarce breeds, being isolated, less valid, or generally associated with less-favoured areas, enter into a pattern of disappearance and substitution.

It is unsurprising that geneticists are considering the long-term efficiency of the model followed and are concerned about what has been lost and what is being lost, such as traits of breeds that could become essential in the future. The concern of the geneticists and other experts is supported by that aroused by the increasing dependence on the consumption of fodder and the abandonment of natural grazing resources.

Extensive livestock farming based on our autochthonous breeds has traditionally been, and continues to be so, a form of production of incalculable richness from the economic, social and environmental points of view.

Therefore it is understood that the autochthonous Spanish breeds should in principle be the most appropriate as a starting point in any livestock policy aiming to increase the use of the abundant natural resources and to conserve the highly valuable pasture ecosystems and “dehesas.”

It is worth adding in favour of the promotion of autochthonous breeds, that they form a part of the cultural heritage of the different Autonomous Communities, as well as being a key player in the maintenance of the ecological balance.

Bearing all this in mind, it seems advisable to encourage extensive farming, based on autochthonous Spanish breeds. This will allow biotypes to be improved, the habitat to be conserved, and the job of establishing the local population in the rural environment to be undertaken. In the long term this will guarantee competitive livestock farming activity and quality products.

With respect to this, Royal Decree 145/1999 has been approved, which promotes the autochthonous breeds of cattle reared under extensive farming, and the regime of horizontal measures. The latter was defined in Royal Decree 51/1995, concerning the promotion of agricultural farming compatible with the demands of protection and conservation of the natural environment, which protects a range of breeds in danger of extinction.

3.3. OTHER FOREST PRODUCTS

The great biological diversity to be found in the Spanish forests is also a source of other forest products that, although to a lesser extent than timber, have always been harvested and have provided additional incomes to supplement the agrarian economy. Traditionally these products were considered to be secondary forest harvestings, but the new economies invest them with not inconsequential values for the future.

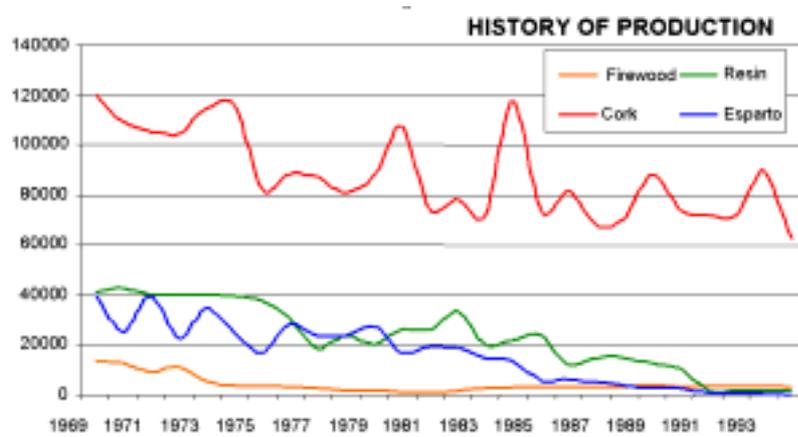


Figure 4: Secondary uses³³

The extraction of these products has decreased in recent times due fundamentally to the exodus of the rural population to the large urban centres. However, many of them are highly valued, and thus have never really ceased to be exploited. The main products, in order of importance, are:

- € Production of biomass for energy
- € Resins
- € Cork
- € Esparto grass
- € Fruits
- € Mushrooms
- € Various plants

3.3.1. Fuelwood and biomass

For several years, the use of renewable energy resources has been promoted in most industrialized countries due to the awareness that sources of energy are used in such large quantities. A very high proportion of these latter sources are based on the extraction and burning of fossil fuels and, as well as being limited on a global scale, also have undesirable effects on the environment. One of the renewable resources is vegetation biomass, which comes from agricultural crops, forest, and other wooded lands.

³³ *Agricultural Statistics Yearbook*



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FIREWOODS			
Species	Tree Felling Stereo	Value (thousands of pesetas) Felled	Value (thousands of pesetas) In stock
Conifers	691 911	410 757 964 391	1 518 975
Shrubbery	27 15	1 327 15	1 518 975
Non-coniferous deciduous	1 195 170	1 511 328	1 195 170
TOTAL	2 114 096	2 012 025	3 233 120
For other industrial use	1 195 170	1 697 521 2 937	
Total firewood for burning in ovens	3 216 465	3 709 552	21 546 357

Table 11: Fuelwood harvesting³⁴

There are a range of plant products in the forest that in former times were harvested for various ends and that are not currently used or have been abandoned in the forest. Such is the case of the fuelwood obtained as a by-product of tree felling, which is used as fuel in rural homes for cooking and heating. The same occurs with shrubbery, which is also a traditional source of fuel, and has proliferated in the forests following the easing of grazing incidence and also the disappearance of ovens, which were formerly fed with firewood.

Currently a high proportion of this firewood is left in the forest as it is not collected by the population, since their needs are met by other fuels that are more convenient to transport and store. This engenders a double danger for the forests. First, they give horizontal continuity to the tree storey, with consequences for the extent to which forest fires may spread. Second, the presence of large quantities of dead plant material gives rise to accumulations of borer insects, fungi, and other harmful agents that can attack and seriously damage the living forest mass when its defences are reduced as a consequence of an external agent (atmospheric pollution, drought, etc.).

It is calculated that some 3,500,000 stereos or 2,000,000 m³ annually of small fuelwood result from tree felling, equivalent to 1,600,000 mT. Approximately 2,000 mT are produced annually by the timber industries.

Currently, timber yielding products of little value and the residues of the timber industry are being increasingly exploited as raw material for the grinding industry – boards and pulp – and with the need to acquire and use new energy sources, the unexploitable material is beginning to be recovered for the purpose of producing fuel. However, instead of using them directly, they are transformed into products of greater energetic power, generally by mechanical processes. Likewise, in some places, the cultivation of forest products has been fostered to these ends in marginal lands and those that are excess to the requirements of agricultural cultivation. These are crops that generate employment and supplementary income in the rural areas where they are located. This is due to the fact that in small industrial establishments, such as those with pottery or bakery ovens, the use of briquettes made from these materials is economically advantageous, assuming that the density is sufficient.

³⁴ *Agricultural Statistics Yearbook*



However, there is a risk that injudicious economic planning will generate a local demand for forest products that is greater than the forests can meet in a sustainable manner, thus encouraging fellings or thinnings that are undesirable from the point of view of other prevalent functions of the forest. For this reason there is a need for an appropriate analysis to be conducted of the entire life cycle of these systems, or a long-term environmental impact study, to determine whether the excess demand could be significant.

Since 1997, a Working Group including representatives of the Ministry of Agriculture Fisheries and Food, the Institute for the Diversification and Saving of Energy and the Ministry of the Environment, has existed, with the aim of formulating the Biomass Energy Programme within the framework of the Plan for the Promotion of Renewable Energies. This Group produced a document in May 1998 that summarized future public policy with respect to the matter: Basic Information for the Production of a Biomass Energy Programme 1998-2010, currently in its draft phase. This is considering the use of more than 400 000 ha of agricultural land for woody crops with energy purposes, employing silviculture techniques for its management. This will require changes in European Union legislation and aid to the owners of these lands, but these must not distort the timber market in any way.

3.3.2. Resin

Pine resin, or resin pitch, is a forest product with broad and modern industrial applications. It is obtained from living trees, for which reason it is a natural renewable resource.

Currently, only Portugal, Spain and Greece are producers. The most suitable pines are *P. pinaster* in Spain and Portugal and *P. halepensis* in Greece.

With respect to resins, the production of turpentine and colophony by the tapping of trees, mainly of *Pinus pinaster* and other pines to a lesser extent, was very important until the end of the 1970s, Spain being one of the foremost European producers. However, the tapping methods required a considerable and highly specialized workforce. Due to emigration to the industrial areas in those areas, the scarcity of this specialized workforce was felt, the dearth of labour undermining the economic viability of the practice.

Tapping methods have evolved considerably, and currently use the downward bark chipping face tapping system, simultaneously employing different types of spacing between chipping faces, number of notches (several chipping faces) which constitute a face in a resin tapping plan, etc. These methods can be applied by a less specialized workforce who can thus work in this sector. With the establishment of these more modern resin extraction techniques it has been possible to turn the sector around and to increase production.

It is important to point out that the resin sector in the European Union is loss-making; it is produced in member States from the south of Europe and does not come into competition with the other types of production in the northern forests. The evaluation of the



Mediterranean forests clearly depends on resin, as it is a product that can provide income and annual employment.

The social capacity for the exploitation of resin is very great, because of the labour force used in its production and the industrial network of first-stage processing that has to be involved in the production in order to be profitable.

Europe consumes around 24% of the worldwide product of colophonies, of which it only produces 10%, the rest being imported. This means that there is an industrial and trade interest in making good this deficit, provided that its production by the E.U. is consistent with the objectives of the Common Agricultural Policy (CAP) and those of forestry, social and environmental policy. A policy favouring resin extraction would help to equalize the north-south differences in forest resources, without provoking conflict because they are different resources.

Resin cannot be extracted from all forest species. However, two species, *Pinus pinaster*, which is more adapted to granite or slaty soils, and *Pinus halepensis*, which is better adapted to limy soils, are suitable for its extraction, although there may be qualitative and quantitative differences between the resin pitches. This allows the range of current possibilities to be extended into areas where the sole wood product output does not make the harvesting of the forest worthwhile. Consequently, its forests are not managed, leaving them at risk of abandonment and forest fires.

The repercussions of resin tapping on employment contribute to the fulfilment of one of the most important objectives of the recent CAP reform, since modern methods account for 2.5 days work/ha per year in the labour undertaken in the woodland.

The appearance of resins in the Spanish market from other countries such as Brazil, China and Indonesia, where the workforce involved in extraction –the main cost factor– costs less, undermined national yield at the beginning of the 1990s.

Another important factor was the appearance of products derived from other materials that could be used to a substantial extent as turpentine and colophony substitutes, which caused the demand for these products to drop noticeably.

These events have not only happened in Spain but also in all Mediterranean countries where tapping has been increasingly abandoned to the point of practically disappearing. In the main, it has been the Asiatic countries that have taken over the market, since their labour costs are generally much lower.

Table 12 shows the evolution of this harvesting, from 40 913 metric tonnes collected in 1969 to 2 149 metric tonnes in 1994. Resin pitch yield decreased gradually until 1986, when there was a fall of almost 50% from the 1985 levels of production, falling dramatically in 1991 to 10% of the amount extracted in 1990.



YEAR	PRODUCTION (mt)	VALUE (Million pesetas)
1990	1 062	55
1991	1 759	65
1992	1 771	125
1993	1 662	113
1994	2 140	229
1995	2 225	182
1996	3 411	364

Table 12: History of resin production³⁵

However, after an awareness campaign in 1995, and with the new resin extraction and collection techniques that are currently being adopted, which require much less physical work, and yield greater production per tapped trunk and a higher quality product, the sector is reviving, and there are good prospects for the near future. This activity requires a large number of working days, both in the extraction of resin from the forest and in the resin industry, independent of the indirect aspects that are also generated. Thus the social considerations with respect to the upturn in this activity mean that this must be one of the priority aspects of the sector policy of the State Administration in co-operation with the Autonomic and Local Administrations

Possible activities were confirmed in the Conclusions of the I Symposium on the Harvesting of Natural Resins, held in Segovia in February 1998, in which all the producing European nations (or those that had been producers during the 20th century, such as Italy) participated, and in the DG VI – Agriculture of the European Union.

3.3.3. Cork

This product is, even today, the second most economically important activity in the forests.

Cork is a natural product of the forest, with properties of elasticity, heat resistance and fire-retardance, low specific weight and extraordinary durability.

The cork oak (*Q. suber L.*) covers an area of 500 000 ha in Spain, with an average annual yield of 75 000 mT and is worth 51 000 million pesetas to the manufacturing industry.

As may be seen from the statistics of recent years, there is a marked downward tendency in production. This appears to be due to the abandonment of cork extraction by small companies because of the low prices, the increasing costs of the extraction and the administrative obstacles in particular Autonomous Communities.

³⁵ *Agricultural Statistics Yearbook –1997 figures (provisional)*



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In social terms the cork industry occupies an important place in the national economy. The sector employs 12 872 people. 3 745 of the jobs are industrial, 6 000 are jobs indirectly connected with the sector and 3 128 are dedicated to obtaining the cork. These figures do not easily reveal how important and necessary family labour is to the sector. There are 170 establishments made up of between 20 and 100 people.

YEAR	PRODUCTION (Thousands of bundles)	VALUE (Millions pesetas)
1990	73 802	7 488
1991	72 146	6 540
1992	72 090	7 077
1993	89 936	8 589
1994	62 797	6 776
1995	57 509	6 694

Table 13 : History of cork production³⁶

Portugal and Spain have always been the primary producers of cork, this typically Mediterranean product, with its many applications (as stoppers, sheets of cork for panels, isolation, etc.), and extensive use in many countries. With the income from both countries, the European Union has become the biggest cork producer and consumer of cork products, above all, of stoppers. Spain has a surplus of this product, as demonstrated by the export-import balance.

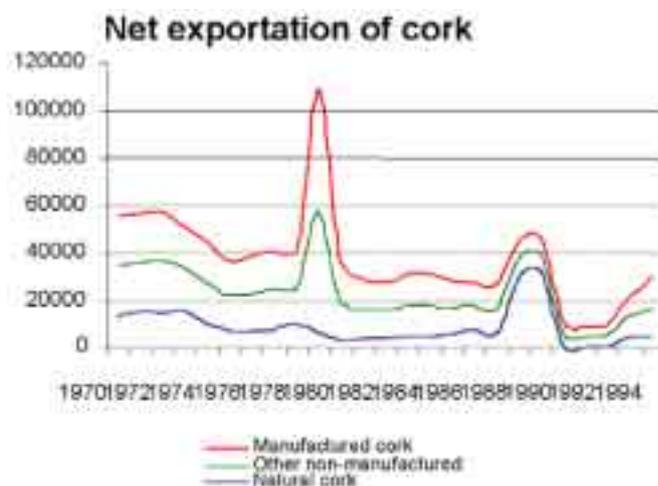


Figure 5: Cork exports³⁷

Spanish production of raw cork and its by- products has suffered the vicissitudes of a product whose price is greatly influenced by the cost of labour, which has been high due to rural depopulation. Even despite the irregularity of the annual harvests, production remained

³⁶ *Agricultural Statistics Yearbook*

³⁷ *Agricultural Statistics Yearbook*



fairly stable until the mid-1970s. It suffered a marked fall in 1975, and since then production has remained at around 75 000 mT/year on average.

We are currently witnessing a new boost in demand for this product, generated by the campaigns of the producers and processors in the two countries of the Iberian Peninsula, who have reached an agreement with the adoption of a logo for cork products promoting them as a natural renewable product with unbeatable properties for the purposes to which it is put. Also, the FAO, has established a special cork oak silviculture programme as part of the *Silva Mediterranea*, which is being supported by both countries with the aim of encouraging expansion.

The cork sector, as an industrial sector, prepares and manufactures the bark of cork oaks, exports 29 135 tonnes as sheets, and retains the rest for subsequent processing in the manufacturing industry. Overall, the cost of production is 51 000 million pesetas. Net exports amount to 16 186 million pesetas, in other words, 31 % of the cost of production.

3.3.4. Esparto grass

Due to its many uses, esparto grass (*Stipa tenacissima L.*) underwent a boom when Spain began develop industrially in the 1960s. Consequently, it was thought that it would provide a solution for many depressed regions, but currently the product no longer retains much of its former usefulness.

Exogenous and endogenous factors affect the outlook for esparto grass and, as has been mentioned, the crisis in the sector began at the end of the 1950s with the timid liberalization of the market. This crisis affected more than 20 000 workers and more than 1 600 companies in the esparto grass, paper manufacturing and jute processing industries.

The reason for this decrease in the harvesting of esparto grass was due to the increase in the cost of the wages of the workers involved in harvesting it. It has not been possible to mechanize the process and, given the difficulty, harshness and precariousness of its exploitation, it has become not very economically profitable due to competition with the costs of other fibres of equal or higher quality (jute, sisal, flax, etc.) and even esparto grass imported from Algeria and Morocco.



YEAR	PRODUCTION (mT)	VALUE (Millions pesetas)
1990	2 571	70
1991	1 522	4*
1992	796	20
1993	376	5
1994	69	2
1995	231	5
1996	35	1

Table 14: Esparto production³⁸

The reduction of the geographical area of esparto grass lands was due to the enthusiasm of landowners to plough up land, taking advantage of the suitability of the soils where esparto grass grew. Due to its depth, quality and lack of steep slopes it became highly profitable to change to cultivating other non-irrigated crops with their greater subsequent productivity. What remains of this practice today is merely token, and is scarcely enough to supply a few industries. It survives almost as a handicraft, supported by few resources. It provides employment to workers who subsist with difficulty.

Spanish esparto grass land occupies an area of 408,578 ha, and is falling: in 1968 684 000 ha were under cultivation. The yield has declined to 89 mT in 1994, whereas in 1969 it reached 40,757 mT.³⁹

As it is a xerophyllic plant its existence is restricted fundamentally to the SE of the peninsula, in the provinces of Murcia, Almería, Granada and Albacete, although it is also present in other places in Spain. The main function of the esparto grass lands is currently to provide the soil of the most arid lands of the peninsula, and those with a tendency to be eroded, with vegetation cover. This affords them some measure of protection, given that it is generally very difficult to introduce any other type of vegetation.

3.3.5. Fruits, mushrooms and other plants

Those used in cakes (pine nuts, chestnuts, almonds, etc.) and for making liqueurs (acorns, sloes, juniper berries and others) are worthy of mention. The harvesting and treatment of the fruits for human consumption gives rise to a large number of jobs during a period of seasonal unemployment in many municipalities. They thereby command high prices in the market.

The **sloe** was obtained from wild plants, but this shrub is perfectly appropriate for cultivation in mountain agricultural areas. The main use of the sloe is for the production of *pacharán*, whose consumption has risen very sharply. The distribution centres move 2.1 million litres, of which half is sold directly in food hypermarket and supermarket chains.

³⁸ *Agricultural Statistics Yearbook*

³⁹ *Agricultural Statistics Yearbook*



The evolution of the sloe market is difficult to predict. The future of the market in this country for the consumption of fresh and frozen sloes is beginning to look bright.

Demand for this fruit is also increasing due to its use in the manufacture of sloe jam. As is the case for the consumption of wild blackberry jam, that of sloes is beginning to increase. The effective regulation of its marketing is desirable, promoting it in afforested agricultural areas, developing it in a harmonious manner, and with an appropriate co-operative framework to facilitate its horizontal and vertical introduction into the market.

The **chestnut**, the fruit of *Castanea sativa* L., has a bright economic perspective due to its industrialization. The quality of the chestnut is determined by several characters, among others, the *tabicación* (from French terminology). There is a variety known as "marrón", in which less than 12% of the nuts are subjected to this, and the Italian denomination "marroni", which further requires a calibre of 70 nuts/kg. The European production of chestnuts has fallen and its consumption is currently directed towards its industrialization for luxury products (*marrón glacé*). The most important features for selecting chestnuts for turning into marrón glacé or marrón au natural are the calibre, tabicación and ease of shelling.

YEAR	PRODUCTION m ³	VALUE trillions ptas	PRICE ptas / m ³
1980	23 605	1 911 415	80 975
1981	18 942	1 625 918	85 837
1982	21 698	1 719 580	79 264
1983	23 847	1 656 543	69 591
1984	19 441	1 799 182	92 510
1985	10 075	1 058 231	105 035

Table 15: Chestnut production and value⁴⁰

The **walnut**, from *Juglans regia*, has always been a fruit eaten on special occasions. Production begins to pick up once interest in this crop is awoken and regular plantations are set up. The demand for walnut has turned Spain into the second biggest importer of this product in the world and among the top consumers per capita ahead of the United States and Germany. The USA is also a large and growing importer of walnuts due to its consumption in several of its member states.

Sale of walnuts, as long as they are of good quality, does not currently present any problems. In principle, considering the great tradition of the Spanish nuts and dried fruit market and the imports, it does not seem that it would be difficult to introduce a new product into this commercial network of fruits of forest origin in the near future.

Spain is the world's biggest producer **pine nuts**, which come from *Pinus pinea*, and their consumption world-wide is in deficit. This pine is strongly resistant to drought, and is

⁴⁰ *Agricultural Statistics Yearbook*



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present on practically irreplaceable siliceous Mediterranean soils. The main producing Communities are Castile and Leon, Catalonia, Andalusia , Castile - La Mancha and Valencia.

Research interest has progressed considerably in this species, but the results take a long time to be applied, mainly due to the fact than many owners are aware that the production of pine nuts is a marginal activity, but also because of the lack of accountability in the trade in this product, which greatly favours speculation. This is partly explained by its ease of conservation and partly because it is possible to predict the harvest in advance due to the nuts being held for three years.

As the pine nut is a product that generates a large number of jobs, its cultivation provides seasonal work for a large number of workers during the harvesting period. It is therefore an eminently social product and there are good markets for the pine nut, although the prices are falling.

YEAR	PRODUCTION (mt)	VALUE (thousands of pes)	PRICE (plaz/m ³)
1990	5 127	1 442 557	281 420
1991	7 210	2 302 210	319 575
1992	9 389	2 840 656	302 550
1993	6 111	1 625 080	266 508
1994	3 032	1 060 978	350 532
1995	5 441	1 716 462	315 490

Table 16: Pine nut yield and prices⁴¹

The economic importance of the product stems from the workforce required, since the collection of the cones and their fruit is carried out manually.

The marketing, currently limited to the national market, is increasingly opening up to possibilities for export. The cost to the company of obtaining the pine nuts usually generates various financing problems since the fruit is bought in the autumn and it is necessary to wait until the following autumn before disposing of it.

There is no better way to conserve them than by keeping them in jute bags in a cool place (8 – 20 degrees), or in glass bottles, cellophane bags or suitable plastic packaging. In this way they last indefinitely and do not lose their excellent characteristics.

A problem has arisen in the Spanish market due to the importation of Asiatic pine nuts. To resolve this, the European Union should implement appropriate measures to protect this market, while being aware of the difficulty involved.

⁴¹ *Agricultural Statistics Yearbook*



YEAR	PRODUCTION kg	VALUE thousands pes	PRICE pes/kg
1990	9 518 000	8 238 906	635
1991	7 471 675	3 821 877	512
1992	6 086 645	3 865 968	635
1993	7 623 918	5 549 649	728
1994	5 831 470	5 189 810	680
1995	25 783 442	8 054 625	212

Table 17: Mushroom production⁴²

The **acorn**, the fruit of different species of *Quercus*, is not only used for human and industrial consumption, but is also used for feeding livestock on mast. This is practised most widely in Extremadura and Andalusia, but also in Salamanca and the Balearic Islands.

YEAR	PRODUCTION		VALUE			
	kg	thousands pes	kg	thousands pes	pes/kg	thousands pes
1990	6 244 276	19 195	96 975	28 522	325 300	3 400
1991	5 243 175	15 372	81 965	18 650	341 078	4 395
1992	3 703 468	14 786	3 697	24 812	250 454	149
1993	5 028 443	15 083	276 953	108 951	333 391	2 542
1994	5 412 219	14 040	315 413	23 940	385 492	13 217
1995	1 754 262	14 270	275 025	26 903	123 288	10 223

Table 18: Acorn production⁴³

In the case of **mushrooms**, Spanish forests are a huge store room of biological diversity, as manifested by the great variety of species of flora and fauna that have their home there. Among these, mushrooms are remarkable for the great abundance of specimens and numbers of species represented. Each of them is usually associated with the vegetation type of the forest. Thus, pine sites are associated with certain species such as the *níscalo* (milk cap) or *rovellón* (*Lactarius deliciosus*). Other characteristic species grow in the oak stands and poplar groves, and on shrubberies and grasslands.

We find the following applications of fungi in the food industry:

- ∄ Mycelia of *Morchetta* and *Agricus*, as a flavour and smell enhancer in prepared foods, dried soups and meat extract, etc.
- ∄ Mycelia of cultivated fungi such as *Pienrotus*, *Agaricus*, etc. Commercial enzymes derived from mycelia: cellulases, hemicellulases, etc.

⁴² Agricultural Statistics Yearbook

⁴³ Agricultural Statistics Yearbook



For these reasons, unifying criteria should be drawn up in all sectors to promote these products and achieve viability in the market.

It is worth making special mention of the black (*melanosporum*) and white (*magnate*) truffles on account of the high prices they command in the market. They are found on limy soils, at altitudes between 200 and 1200 m, forming mycorrhizae with holm oak and hazel trees. The most productive areas for truffles are found in the north-east quadrant of the peninsula: Maestrazgo, Catalonia, Aragon (Huesca and Teruel), Cuenca, Guadalajara and Soria, in Extremadura, and to a lesser extent in Navarra and La Rioja.

From antiquity, the exquisite flavour of the spore-bearing systems of some species of the genus *Tuber* has made the truffle highly sought after in the oak forests, where it spontaneously appears in symbiosis with the main species. However, a research programme is needed to investigate the black truffle and its ecology.

It has a good export market with prices varying as is typical for a poorly transparent market, controlled in the final stages by the great demand but with a prolix network of commission agents, brokers, etc. The Morella market in Castellón, has a long tradition, where transactions of products from various and, at times, distinct areas are made.

YEAR	PRODUCTION kg	VALUE thousands pes	PRICE pes/kg
1990	25 545	506 353	19 846
1991	51 655	730 290	14 137
1992	30 188	530 437	17 571
1993	53 100	1 172 286	27 727
1994	34 908	947 400	27 375
1995	24 478	707 036	28 885

Table 19: Truffle production

The data of recent years show sharp saw-tooth fluctuations over time, reflecting large differences due to the market. It is therefore difficult to obtain reliable statistics for markets with such characteristics. In any case, however, what is certain is that this is a highly valued product.

Our production is almost entirely exported to France, following simple preparation to conserve the truffles during their journey.

The harvesting and marketing require a large number of working days, which usually coincide with the period of slackest agricultural activity, thus serving as a supplementary income in rural areas.



With respect to other products of the forests, there is a range of traditional uses of lesser importance, both in terms of the products obtained and their economic value, and even due to their limitation to restricted and very specific areas.

3.3.6. Medicinal and aromatic plants

It is very difficult to estimate the volume of aromatic and medicinal plants that is produced, whether through harvesting or cultivation, due to the official data either not existing or not being very reliable. According to current statistics⁴⁴, 83 Tm of medicinal plants are harvested in Murcia and an appreciable quantity in Valencia. In Huesca, Cáceres, Cádiz and Granada, various other plants are used, yielding a total of 12.668 Tm. But these amounts are much lower than the amounts actually harvested. Fifteen species are harvested on a large scale in Spain, many occur in large numbers, but a lot of them are decreasing or are clearly on the decline (gentian, some thyme species, *té de roca* and bitter camomile, for example).

YEAR	PRODUCTION Tm	VALUE \$CO Ptas	PRICE ptas/Tm
1990	602	7.511	12.477
1991	62	1.376	22.194
1992	131	1.329	10.149
1993	689	14.736	21.388
1994	83	1.819	21.916
1995	2.103	16.405	7.801

Table 20: Medicinal plants⁴⁵

In general terms, there are no problems as proportionally a very small proportion is harvested in relation to actual numbers. Demand for this kind of plant is growing, however, for use in various sectors (aromatherapy, cosmetics, liqueurs, perfumes, food, phytotherapy, pharmacy, etc.), and the pressure on the wild population is growing. This situation has led to legislation on harvesting in some Autonomous Communities (for example, gentian in Catalonia, thyme and rosemary in Andalucía).

This increase in demand has also meant greater interest in cultivating these species. In Spain, some aromatic and medicinal plants are cultivated in a controlled way, but most of these crops are experimental (arnica, *Artemisia granotensis*, borage, *Echinacea purpurea*, gentian, *té de roca*, rue, savory, *Spirulina sp.*, thymes) and are rarely the basis for founding productive holdings. In the past, a larger land area was cultivated, but production decreased exponentially due to the low prices of imports and by-products (essential oils). Around 7.000 ha of aromatic and medicinal plants are cultivated, of which 4.000 ha are lavender (started in the 70s with state aid and grants, but over half the land area has been abandoned). The main crops are saffron, hops, lavender, camomile, balm, mint, anise and sage. Tarragon, coriander, cumin, digitalis, fennel, hyssop, marjoram, poppy occupy smaller areas. On the other hand,

⁴⁴ Agricultural Statistics Annual

⁴⁵ Lavender, "lavandín", rosemary and thyme - Directory of Agricultural Statistics



some crops have been completely or partially abandoned (belladonna, *Doturo inoxio*, liquorice, clary, etc.).

Despite the interest of these and many other species, their development has been halted for several reasons. The most noteworthy is lack of knowledge about the botanical and chemical characteristics of native aromatic-medicinal flora. Very few in-depth agricultural or pharmaceutical studies have been carried out, so selection work and improvement of plant material is needed in order to obtain plants that develop homogeneously with a high content of active ingredients (medicinal) and essential oils (aromatic). This will produce a rational crop with selected plant material.

The growers' main concerns are instability of prices and lack of technical assistance from the Administration as regards the viability of growing medicinal plants. To date, research efforts have been directed almost exclusively at growing aromatic plants to obtain essential oils due to the relative importance of distilling in Spain, a market controlled by distillers and intermediaries in Murcia.

Until a few years ago the spontaneous flowering of medicinal plants was exploited sporadically and was a very rudimentary operation. Despite this, the lack of specialised harvesters and competition from countries with cheap labour has led to minimum growth in production, ignoring the strong world increase in demand.

On the other hand, Spain is one of the countries best suited to growing these crops due to its varied flora, which includes almost all the Mediterranean and European flora, and to the many microclimates where they can be grown. Furthermore, Spain has about 1.200 endemisms (50% in the Canary Islands), while in France, for example, there are only from 60 to 80 endemic species and in Germany between 7 and 8. Its characteristics could, therefore, make it a great provider of aromatic and medicinal plants.

Growing aromatic and medicinal plants is one of the most interesting technical and cultural opportunities on the Iberian Peninsula. Many Spanish districts have ideal agroclimatic characteristics for these crops. Such areas are generally characterised by scarce rainfall and considerable altitude, with poor or erratic profitability in cereal growing and a progressive problem of depopulation, followed by an increase in the risks of erosion and environmental deterioration.. Thus, the introduction of improved varieties and cultivation using modern techniques may be a real alternative for the improvement of agricultural profitability in these areas, as well as contributing to social cohesion and conservation of the countryside.

Harvesting tends not to be viable because of the high labour costs and so the solution lies in cultivation. The high harvesting costs are due not only to great dispersion or habitat with difficult access, but also to transport, drying and other processes although the plant itself costs nothing. Nevertheless, harvesting in the wild is supplementary aid for farmers who normally cultivate aromatic and medicinal plants.



The advantages of cultivating aromatic and medicinal plants in relation to harvesting wild species are:

- € it avoids mixtures and falsification of harvested material
- € it obtains homogenous raw material, in large amounts and of good quality, allowing a regular supply; helping to protect the species as their survival would be threatened by very intensive harvesting;
- € harvesting is facilitated and in many cases may be mechanised; farmers may organise themselves in co-operatives and create agricultural first-stage processing industries (dryers and distillers); cultivation anchors the specialized rural labour force

Harvesting costs are therefore presumably higher than those in a specialised herbal harvesting that is well mechanised and equipped and run according to active rational and scientific agricultural and industrial principles. However, such agricultural mechanisation and modernisation are undeniably costly, being virtually only within reach of the large producers (despite the grants available). But this process, which is by no means exclusive to agriculture, is unstoppable and there is no other solution other than to adapt to it so as not to be left out.

It is essential to know about spontaneous aromatic flora and the composition of essences in order to grow them. In Spain, this has perhaps been neglected to a certain extent because the abundance of Spain's flora was more than sufficient to be able to harvest it. Spain has had to go through the transition of rudimentary exploitation of spontaneous flora to rational exploitation of cultivated plants. Exploiting these species (rosemary, sage, thyme, oregano, lavender, etc.) should be the basis of totally mechanised farming with selected ecotypes and modern distilleries.

As regards marketing opportunities, a market research study by the Ministry of Agriculture, Fisheries and Food finds that in general terms almost 90% of the plants produced in Spain are spontaneous aromatic flora.

The aims are to become self-sufficient in species that can be cultivated, either because they are spontaneous or because ecological conditions permit, and to cultivate each species over enough land to maintain consumption and exports so that in 4 or 5 years 90% of today's spontaneous output is produced through cultivation.

3.4. GAME HUNTING

Forest landscapes are the ones that have most profoundly marked the identity of the mountains. The fact that they have always been complex systems with diversified economies and functions, both complementary and interdependent, has demanded a more comprehensive consideration of their forest land, both in research studies and in deciding on their development and overall planning. Thus, game hunting must be considered as just another



economic activity which could in no way be detached from the overall concept of forest landscapes. Of course, game hunting is not strictly a forest activity. It is often an agricultural-Forest Activity, and many aspects related with agricultural policy affect game quality, especially small game species.

Nowadays, game hunting not only involves the multiple functions that characterise forest land - production, protection, tourism, leisure, etc., but its growth is also very closely linked with the same problem of integrating the traditional agrarian economy of the mountains into the modern economy.

The game hunting sector has not only been able to respond to the new demands of urban leisure, the aspirations of certain groups and the interests of numerous owners of forests where the best big game examples are found, who have seen it as an alternative for holdings in crisis. It has also been able to optimise the favourable physical and structural conditions of forests and other wooded lands for game hunting. The competition between traditional agricultural, livestock and forest uses and the sudden upsurge of game hunting in its three-fold guise of leisure, economic activity and environmental conservation has thus occurred under these conditions.

Spain has been particularly fortunate when it comes to suitable natural conditions for all kinds of game species.

It is thus difficult to discriminate between the game hunting features of the various parts of the country, given that the whole of Spain is excellent for game species, although certain small areas do have their specialities.

Natural conditions favour the three large groups of game species in Spain: 1) small game species, including the particularly valuable red partridge (*Alectoris rufa*), rabbit (*Oryctolagus cuniculus*) and hare (*Lepus granatensis*) found on flat or gently undulating land given over to cereals, vines and olive groves and mixed with areas of coppice unsuitable for cultivation with dispersed vegetation cover with a predominance of shrubbery and isolated holm oaks.

Big game occurs in mountainous habitat. The most noteworthy species in terms of distribution area and numbers are red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), fallow deer (*Dama dama*), wild boar (*Sus scrofa*) and in low mountain areas male Spanish mountain goat (*Capra hispanica*), chamois (*Rupicapra pyrenaica*), etc.

Forest land has great potential to produce and maintain game, particularly herbivorous or omnivorous species. The decline in traditional uses of Spain's forest areas, pasture land, firewood, aromatic plants, bark, resins, etc. have made available large areas of land with better and more numerous feeding resources for the combined agriculture-forestry-hunting activity of producing game animals. This fact, along with a growing demand for hunting resources, has led to an increase in numbers of large game and in their use, allowing selective practices to obtain better and more spectacular trophies with the resulting increase in income from that kind of land.



Some owners of forest land have come to regard hunting as a substitute for traditional livestock farmings, devoting great effort and financial means to improving trophies and raising the level of income of the districts where they are located.

Over 35 million hectares are classed as hunting land in the various kinds of big and small game hunting and a smaller proportion to wildfowling. This large land surface is subject to game hunting, generating an economic activity that has without a doubt to be compatible with other activities, especially with natural conservation and with a respect for biodiversity. Well-managed game hunting land makes a very decisive contribution to maintaining Spain's natural wealth.

Natural and extensive production of game species, meaning as such that which maintains the various populations during their life cycles in the physical environment, controlling their densities to make them compatible with the feeding capacity of the forest land, and with the quiet needed for the population to grow, is known to be beneficial in all socio-economic aspects and to contribute to keeping the land in a natural state.

A very small portion of game species are compatible, to a certain extent, with agricultural habitats provided human movements and interference are not excessive. A larger number of game animals can be maintained relatively well in grazing-forestry biotopes. But some game species, especially certain rare species of Spain's rich and varied fauna, can only be conserved and thrive in very wild habitats. So it is necessary to take into account all kinds of biotopes in order to develop a conservation policy, establishing an order of priority among the different types, taking into account the scarcity and value for wildlife of each one.

The conversion of game hunting areas, should, however, be subordinated to the species recovery programmes covered by Act 4/1989 as occasionally conversion of forest land for hunting may, if a significant amount of land is involved, endanger some threatened species, as may be the case with the lynx (*Linx pardinus*) when open areas are converted into thick scrub which provides shelter for some large game species.

In any case, almost all competencies in this matter correspond to the Autonomous Communities and so a definition of the measures to be taken in this field, which are analysed in the third part of this strategy, must take this inalienable constitutional datum as its starting point. The Environment Sector Conference recently agreed on the future composition of the Inter-regional Forum on Hunting and River Fishing.

3.5. CONTINENTAL FISHERIES

The great wealth of fisheries in Spain's continental waters has a two-fold use. On the one hand, it hosts a large variety of aquatic species living freely in the wild, which make up the basis of sport fishing that fans of outdoor sports consider more than acceptable, providing prime quality proteins, besides fulfilling an important function in the natural food chains and



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maintaining the water in good condition. On the other hand, cultivating fish in industrial centres is the basis of a great trade that has recently acquired great and beneficial economic and social value.

Spain has many stretches of river suitable for fish. The network of rivers is estimated at 72,000 kilometres including 2,000 Km. used for salmon, around 20,000 Km. for trout and 50,000 Km. for Cyprinidae and others. There are also an estimated 500,000 Has. of reservoirs liable to intensive use by fish.

The characteristic of this river network is the small number of large rivers, balanced by considerable variety.

The salmon rivers are located along the Cantabrian belt from the Bidasoa to the Miño. They are characterised by short courses with fast flowing, clear, cool and oxygenated water. The trout rivers or sections of them are usually located in the upper parts and transition areas of most of the river basins, while the water where Cyprinidae and others are found flows mostly through the middle and lower sections of the water courses generally with calm, limestone water and warmer than the afore-mentioned ones.

In these bodies of water, both lotic or flowing and lentic or still, many living organisms hatch, grow, breed and die, interdependent on each other, making up this superorganism known as an aquatic ecosystem. The final products of fish, crabs or any other interesting product have since time immemorial been of special interest to people.

Spain's continental fish fauna comprises 20 families and 59 different species, including such heterogeneous fish as salmon, trout (sea trout, common and rainbow trout, the latter was introduced and aggressively marketed on fish farms), char, lamprey, shad, bogue, carp, various barbel, tench, *Carassius* species, gudgeon, eels and elvers. Introduced species such as pike, gambusia and black bass alternate with crab populations from other latitudes.

This brief list of species of Spanish fish fauna gives some indication of the need to make exploitation compatible with expanding the wealth contained in Spanish waters.

As occurs with game hunting, river fishing is the exclusive responsibility of the Autonomous Communities although attribution of the power for overall management of the inter-regional river basins to the River Confederations, bodies of the national government, makes the situation surrounding that power more complex, something that has only recently been resolved by a verdict of the Constitutional Tribunal. The Autonomous Communities have understood it to be so and have, in practice, formulated policies that can be moulded to today's circumstances and requirements. The Inter-regional Forum for Hunting and River Fishing, which was referred to in the previous section, will be the beginning of greater co-ordination between regional policies.



4. INDUSTRY, CONSULTANCY, ENGINEERING, SERVICES AND THE MARKETING OF FOREST PRODUCTS

Timber and other forest products are scarce and necessary resources. They are necessarily one of the challenges remaining for environment planning authorities to resolve, not only in Spain but also in all economically advanced countries.

The current timber deficit on the national market can be palliated by more individualised management of the existing stands and the reforestation of larger areas. To ensure the success of these policies, however, the profitability of each type of forest treatment must be guaranteed.

Wood consumption trends over recent years and the future market prospects suggest a substantial growth in demand for wood products in an increasingly processed state.

4.1. FOREST ENGINEERING AND CONSULTANCY SERVICES

Traditionally, forestry work has been carried out by the government Forestry Administration. Public companies have arisen relatively recently as totally independent tools of the national⁴⁶, regional and other governments⁴⁷, consolidated legally under the 1998 Spanish Budget Accompaniment Acts and Acts of the Autonomous Communities, all of which have made their tasks more effective.

The forestry industry is now mature enough to permit its privatisation in the medium-term, as suggested and apparently understood by business organisations, some co-operatives and trades unions.

The analysis of the industry has brought to light several problem areas most notably:

- § Generally small companies, mostly family businesses with funding problems.
- § Widely scattered privately managed mountain forests
- § Low power machinery.
- § The inefficient alienation of certain annual uses.
- § A total lack of connection between forest ownership and the sawmill industry. This work is done by intermediary companies.
- § Lack of mechanisation in forestry work.

⁴⁶ *Transformaciones Agrarias S.A. (TRAGSA), its subsidiary for projects and studies (TRAGSATEC)*

⁴⁷ *EGMASA, GETISA, Forestal Catalana, Viveros y Repoblaciones de Navarra, SEFOBASA, etc.*



- § Lack of acceptable networks of forest tracks, which makes work more expensive or in many cases unprofitable.

4.2. FOREST HARVESTING SUB-SECTOR

The forest harvesting industrial and commercial sub-sector is considered to be the industry that operates in forest uses with a view to supplying timber to processing companies (i.e., without taking into account forest exploitations for domestic consumption, which cannot be strictly classified as an industrial sector despite its economic volume). This sector generates a volume of roughly 30,000 million pesetas in exploitation alone, over 60,000 million pesetas in standing timber purchases; it is responsible for 7,500 jobs (chain-saw operators, engine operators and labourers with the help of some 1,500 machines of which 400 are skidders and self-loaders and 25 are processing heads, all covered by some 400 companies, along with some 900 self-employed workers who together generate sales worth close to 90,000 million pesetas.

In addition to the above-mentioned jobs, employment is generated by the timber marking and management and timber transportation. In the light of the above figures, it is clear that this sector is extremely important in the forest-industry chain in spite of a series of problems listed below:

- ∕ Scattering of forest property/exploitation
- ∕ Lack of business training
- ∕ Little mechanisation (harvesters and processors)
- ∕ Lack of trade associations
- ∕ Lack of specific R+D
- ∕ Deficient exploitation infrastructure
- ∕ Ignorance of the sub-sector as such
- ∕ Tendency towards cultural animosity
- ∕ Non-harmonised Autonomic legislation

4.3. FIRST-STAGE PROCESSING INDUSTRY

The first-stage processing industry is the point where roughcut timber is produced for the subsequent manufacture of final timber products. These industries include sawing, board manufacture, pulp and paper production. The raw material is obtained directly from standing



timber, and the work is done by the companies themselves or by a sub-contracted forestry company. It is also bought through intermediaries.

The sawmill sector is primarily composed of a large number of small companies, although in recent years it has been restructured, leading to the closure of unprofitable mills, while those remaining have increased productivity. Those that are closing have not been prepared to change due to their obsolescence and lack of capital, primarily requiring technical backing and advice as well as training for intermediate staff, i.e., the promotion of job training in the wood industry to improve processes and technical training to meet the requirements of the market, not only in production but also in quality.

The pulp/paper and board sectors are made up of medium and large-sized companies which have grown spectacularly in recent years due to their purchase of high technology for the control of their production processes. These technological changes are not only aimed at increasing productivity and diversification of products, but also strive to guarantee quality and environmental respect. These companies have made a praiseworthy effort to adopt changes in their industrial processes in order to optimise their timber resources by also using timber waste as raw material in the case of the board sector, and waste paper in the paper sector. These new uses have not, however, offset the lack of timber to meet the growing demand for products.

As a whole, then, the first-stage processing industries are faced with a serious shortage of timber in both quantity and quality. This is their main problem, along with other industry difficulties including a need to resize the industries, training in the sawmill industry and certification systems for the rest.

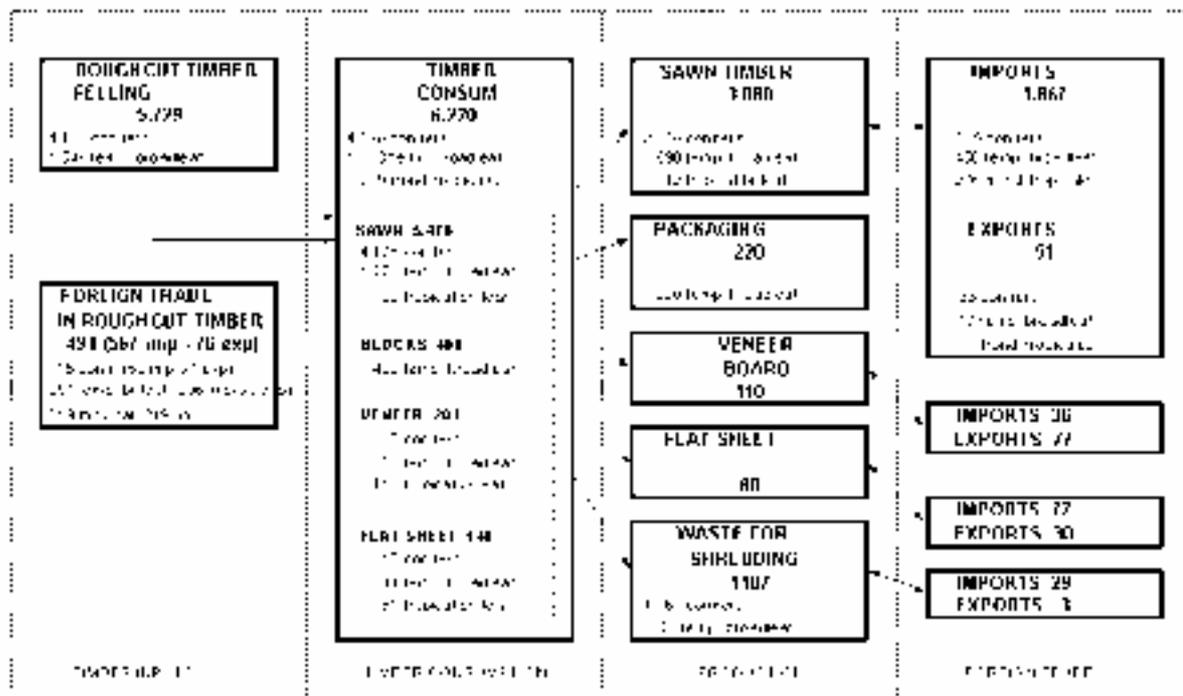


Figure 6: Mill and veneer timber circuit⁴⁸

The present state of the first-stage processing sector is faced with the following problems:

- š Lack of source guarantees for products supplied to the market.
- š Wood qualities and classifications are not subject to an acceptable product standardisation.
- š Promotion of excessive speculation by intermediaries who control the market and ultimately decapitalise sawmills.
- š Sawn timber is supplied without being well stabilised by a good drying process.
- š The timber is not treated properly, leading to a considerable depreciation of the wood.
- š There are no well-defined studies of the physical/mechanical or resistance properties of wood such as those that exist for other consumption materials that reach the market with perfectly clear certificates.

⁴⁸ Documents drafted by MINER



Appendix I of the IPPC Directive⁴⁹ lists the industrial activities affected. These include pulp and paper factories on the one hand and coating and veneer factories on the other, which use a certain amount of organic solvents in certain types of boards. This Directive will define the technical improvements available for the purpose of environmental improvement which will have to be encouraged under national legislation. The first of these industries began this process in 1997, however due to the complexity of the process, a definitive reference document is yet to be produced, while the second group of industries will begin its work in 2001.

4.4. SECOND-STAGE TIMBER PROCESSING INDUSTRY

The second-stage industry consists of the furniture, carpentry (doors, windows and floors), packaging, publications and other sectors, which use the semi-treated products from the first-stage industry. They obtain their raw material from the first-stage processing industry directly, through intermediaries or on the foreign market.

This sector is closely linked to the construction industry and the state of the economy in general. In recent years, demand for these products has increased steadily as a large proportion of the output is for the replacement market in the case of furniture and renovations in the case of carpentry. At present, these industries are striving to improve their technological processes as well as embarking on training plans that result in improved competitive standards, product quality and environmental acceptability. Spain ranks highly amongst Europe's producing countries and has a large export volume.

The second-stage processing sector and timber finishing industry is increasingly demanding better finished products that are at the same time subject to higher quality control and standards wherever possible. By now a high level of automation and technological progress has been reached. The first-stage processing sector has not, however, followed this lead, and is finding it difficult to compete against imported timber which has become highly automated and competitive in production at source and in sales.

⁴⁹ Directive 96/61/CE on integrated pollution prevention and control

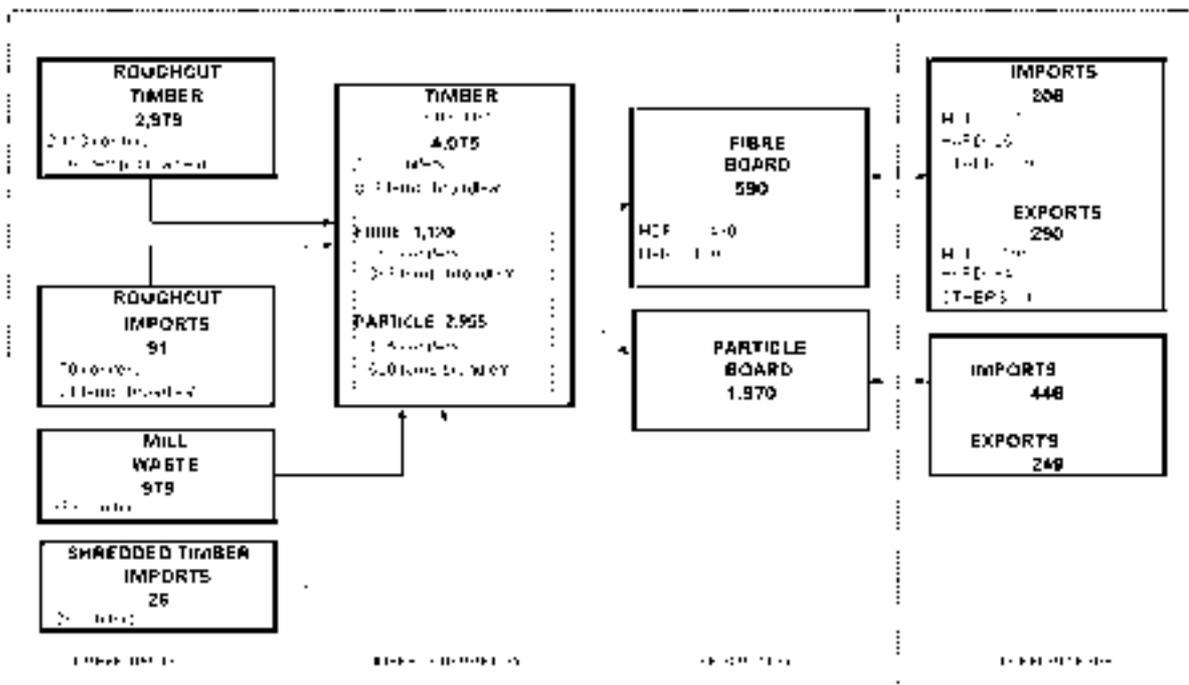


Figure 7: Wood cycle in the board industry⁵⁰

4.5. CERTIFICATION OF SUSTAINABLE SOURCES OF FOREST PRODUCTS

The certification of forest products is aimed at linking the timber marketing to sustainable forest management, and at encouraging the final user to buy goods composed only of products taken from sustainably and managed forests. This initiative has been promoted by NGO's and industrialised countries which are also large-scale imports of forest products, while exporters are trying to generalise the system.

Certification is based on two aspects: firstly, to make external pressure applied through trade a vehicle to oblige improvements in forest management practice, and secondly, to ensure that the market demand for products taken from sustainably managed forests becomes a priority and that the markets are prepared to pay some sort of premium for them (e.g., a higher price, greater demand, a greater market share, etc.). It is still too early to judge the validity of this hypothesis, and thus, in spite of the efforts of many countries, there are still many problems and uncertainties yet to be resolved, some of which are discussed below.

In general, opinions differ widely about the scope and the duration of the economic impact that certification plans can have on the timber trade. At present there is a demand for certain types of environment-friendly or 'green' products in some countries, but there is no

⁵⁰ Documents drafted by MINER



clear evidence that the volume is significant or that consumers are willing to pay a higher price, apart from the case of select products.

While the effects on trade to date have been small (there are no reliable figures, although it is estimated to affect 0.5% of forest products), the issue is producing a considerable degree of commercial uncertainty in many markets and some concern amongst those involved in the forest product trade, from the producer to the retailer. One of these concerns is that unless this certification is applied with caution, it will act as non-tariff barrier to trade and discriminate against those who cannot or do not wish to achieve the required levels of sustainable forest management. It may also hinder the development of poor countries.

If imports are restricted to sources that have been certified as sustainable, even producers who are in a position to comply with the criteria of sustainable forest management may easily find themselves faced with the serious handicap of having to adapt to the differing requirements of each market.

Certification may also favour industrialised countries where forest management practice is moving towards sustainable objectives.

Although it seems likely that the majority of the plans will be voluntary, they may in fact become compulsory given that certain large-scale retailers such as those in the UK, for example, may not wish to trade in uncertified products and consumers may even prefer to buy artificial products produced from non-wood products, as is happening to some degree in certain European countries. There is also a concern that certification may give the consumer the impression that non-labelled products, especially those that have not been analysed, have been produced in an environmentally irresponsible way.

Certification is still at an incipient stage. It seems likely, however, that it will have a constantly growing impact, at least in the next few years, although it is still hard to predict the scope and nature of this impact. Some Spanish companies involved in secondary processing have volunteered to join the FSC⁵¹ certification system promoted in Spain by ADENA–WWF⁵². This is an international third party accreditation system backed by the WWF. In another move, the European associations involved in the forest-industry chain have mobilised to establish a system called PEFC⁵³, the main features of which are: objective accreditation of mutual recognition between countries backed by the Accreditation Treaty amongst European countries, represented in Spain by AENOR, and the potential for certification of sustainable management of small-scale forests at reasonable prices. This system also permits the certification of sustainable management in Mediterranean forests where the indicators match the on-site reality in order to comply with the Helsinki criteria. The European Union is not in favour of establishing an official certification, but rather of encouraging voluntary systems, constantly ensuring that this does not distort Union

⁵¹ FSC: Forest Stewardship Council

⁵² ADENA: Association for the Defence of Nature; WWF: World Wildlife Fund

⁵³ Pan European Forest Certification



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competition internally or externally. The medium-term market effects of these certification systems will depend on a range of factors, but above all on the degree to which certification becomes accepted and trusted by the market. It seems likely that it will start to affect market trends and in the long term, if adopted more widely, may even affect the types of products being sold.

In summary, although it is difficult to predict the direction and scope of certification, it seems most likely that:

- € certification activities will continue to grow, at least in the short to medium term (3-5 years)
- € this growth will probably be fast, at least because there is only a small but important area of forests that complies with the strict definitions of good forest management

It is also important to stress that sustainable forest management, which is ultimately what these systems certify, has certain idiosyncrasies in Mediterranean forests.

At the III Ministerial Conference on Forest Conservation in Europe, the Spanish Ministry of Environment accepted the commitment to readapt the guidelines⁵⁴ to the reality of the Mediterranean forests.

It is therefore advisable to establish an agreement above the Spanish national level to provide credibility as a sub-regional forum to the demands for sustainable management of Mediterranean forests.

The Iberian Declaration on Principles for sustainable forest management, signed on 29 January 1997 by more than 32 representatives of the public and private sectors in Spain and Portugal is a noteworthy forerunner in this potential move towards Mediterranean certification.

The role of governments in this aspect should be limited to establishing a body, an organisation or an institution that will provide all possible certification systems with sufficient transparency, non-discrimination, equal opportunities for credibility, the same rigour and respect for the rules of open competition, given that this certification will in itself become an object integrated into the market. Governments also play an important role in permitting the comparison of different systems and the resolution of possible litigation between parties.

For the purposes of imported forest products, certification is also being debated in the WTO⁵⁵ to prevent it from becoming a non-tariff barrier to international trade in wood products.

⁵⁴ Declaration by the Spanish Environment Minister - Lisbon, 3 June 1998

⁵⁵ World Trade Organization



Just as Spain has been one of the leading countries in the production of CITES guides to timber yielding species closed to international trade, and in the light of the medium-term prospects, the European Union may well require certification for its internal market. There is an urgent need to establish a joint programme with the Autonomous Communities with a view to drafting a set of transparent and precise indicators that can be used openly for these purposes.

4.5. EXPORT PROMOTION PLANS

Exports of wood-derived products is regarded as a necessity, not only to keep jobs but to open the door to sales of the product that can provide most value-added to the sustainable management of our forests.

In January 1998, the Spanish Chamber of Foreign Commerce (ICEX) approved a one-year Plan for the Timber and Furniture Industry, which consisted of funding participation in international fairs, trade missions and the publication of a promotion catalogue.

5. TERTIARY USES OF SPANISH FORESTS

Apart from the increasing if not total tertiarization proposed by game hunting and fishing users, city dwellers visit natural areas on an increasing frequency, producing a growing demand for recreation areas. It is as if aesthetic values were becoming the most important features of the set of cultural/recreational values of natural environments. Forests are the unquestionable paradigm due to their obviously attractive landscapes, sense of tranquillity and other conditions such as their particularly pleasant microclimate. These and other aspects make forests one of the most heavily demanded targets for recreation.

The intensity of this demand, a function of the intrinsic features of the forests themselves and their surroundings, makes the recreational function in some cases a higher or at least equal priority in comparison with the traditional economic or productive aspects. Due to the often-difficult comparison between these functions and the disturbances that recreation can cause to the environment, it is easy to understand that recreation is a source of conflict for forest owners and managers. This is an aspect that must not be ignored in Spain, where more than two thirds of the forest area is in private hands.

In some Autonomous Communities, these forest uses are a basic feature of their territorial or sectorial tourist policy for both internal and external consumption. Certain Communities have specifically included this policy specifically in their legislation. The Andalusia Forest Plan passed by Parliamentary Resolution on 14 and 15 November 1989 contemplates public use planning measures, considered to be the planning of social activities related to leisure, recreation, education and culture. There is an increasingly accepted idea of a special tax on the recreational use of forest and other wooded lands in areas such as



Catalonia and the Balearic Islands, apart from the planning of protected natural areas where this tertiary usage is now unquestionable.

For reasons that vary from one Autonomous Community to another, these tertiary uses have a specific dimension. There are no all-encompassing studies that quantify the value of such uses, although partial analyses have been carried out. In Valencia, for example, one study has estimated that there are 5 million visitors per year to forest areas. Some Autonomic forestry plans already include a specific strategy for these uses. The recent draft Madrid Autonomic Forestry Plan and the basis for the Regional Territorial Strategy proposes a use of the Madrid mountain areas in which the recreational activities by the metropolis and its constantly growing outer suburban belt are a primordial priority in coincidence with the mandate of the Forestry and Nature Conservation Act 16/1995 of 4 May, (Article 2.1§g, and extensive descriptive legislation). This legislative mandate is similar to the contents of almost all other Autonomic Forest Acts. In the case of the Balearic Islands Community, the subordination of the entire forest policy to landscape/tourist uses is the framework for the package of measures, some of which are legislative, others administrative policies and others promotional, which together could be considered as a Regional forestry strategy. The modernisation of rural life in Catalonia, where the use of private forests administered from the Forest Property Centre permits residents to work from home and enjoy the work-leisure-improved quality of life cycle thanks to the improvement in telecommunications, is another example of the increasingly popular range of tertiary uses. A similar trend can be found in other areas such as in the south of the Segovia Province.

5.1. EFFECTS OF THE USE

In spite of the growing social interest in forests and their consequential value-added features, it is a fact that recreational or tourist functions can cause serious damage to forests. The solution is not, however, to eliminate or prohibit them entirely. The use of forests as a place for recreation inevitably involves transformations and disturbances caused by both users and managers, who find themselves forced to prepare areas for the designated use, which may well have negative environmental effects. After planning recreation as a possible forest use, the manager's problem thus resides not so much in preventing disturbances as establishing acceptable limits to changes to prevent critical situations from arising.

The types of impact, both direct and indirect, caused by recreational uses on the basic components of forests, soil, vegetation, fauna and water, may be summarised as follows:

Soil.- Trampling compacts the soil and eliminates the uppermost horizons, which produces disturbances to the microbial flora and fauna, reduces permeability, accelerates erosion and has negative effects on the strength of plants.

Vegetation.- Mechanical damage to adult trees, elimination of shrub cover and sometimes the herbaceous layer, leads to the absence of regeneration.



Wildlife.- Indiscriminate recreational usage affects fauna behaviour patterns, especially those species requiring solitude for their movements and reproduction.

Water.- This resource is a strong attraction for visitors wherever it may be. It is used for both drinking and for sport. The proximity of recreation zones to streams or bodies of water causes eutrophication and cloudiness, with direct effects on public health.

These types of impact become all the more critical when public usage becomes specialised as in the case of ski resorts or the use of local tracks by four wheel drive vehicles.

From the moment that these features become largely responsible for the modelling of the appearance of the area, any disturbance to them will inevitably cause the landscape to be affected by this type of use, paradoxically leading to a loss of quality for recreational usage as the landscape is precisely one of the key attractions for visitors.

In general, the nature and the scope of these types of impact are associated with the recreational model, the type of users and the degree to which the ecosystem can withstand disturbance.

5.2. REGULATION AND PROMOTION OF TERTIARY USES

In the light of this demand, the services and infrastructure required to provide a specific model of recreational use must be included as an additional management feature. It thus becomes obvious that there is a need for solid planning given the complex inter-relationships between the variables involved in the management of forest areas, which are affected considerably by the type of recreational use expected to be offered in accordance with the demand and potential of the resource.

In general terms, forest planning and management for recreation involves a type of action aimed basically at the selection of specific areas and their adaptation to the objectives. Entrances, infrastructure and services to optimise the proposed uses must be installed, along with the regulation, management and control of visitor numbers, with a parallel provision of information and, in certain areas, environmental education services.

The Instructions for Forest Management of 27 January 1930 consider forests or stands of trees reserved for indirect benefits to include those which were used for the purpose of urban recreation or provided in their present or properly treated state, conditions to attract the populations of urban and industrial centres. More recently, the Instructions of Forest Management of 29 December 1970, still in force, includes recreational use of estates, the so-called recreational districts where preference should be given to study of the features or conditions provided for recreation.



At present, like any other mature activity, the public usage of forests has become segmented under Autonomic legislation and planning, and specific types of demand have arisen: recreational, tourist, sporting, cultural and educational. Furthermore, planning and management for these activities must not overlook the demand that they have generated. Citizen preferences must therefore form an essential aspect to be considered in these tasks.

Activities involving a social use are diffuse rather than extractive. This may easily cause their impact on areas of great natural value to be overlooked. It must be remembered that the environmental conditions of diversity and landscape value are the main attraction for visitors.

In this field, the overall goal of government administration should be to maximise the social utility of the resource, which makes it necessary to plan and manage public usage to ensure that it is adapted to social demand, while at the same time ensuring the conservation of the natural resource involved, respecting the visitor capacity of each forest as an individual ecosystem, and treating each type of use separately.

Finally, a further problem posed by the regulation of these types of tertiary usage is the difficulty of evaluating their socio-economic benefits, as many of them have no market price. Only modern systems of economic evaluation that use the contingency method or similar types permit a correct cost-benefit analysis of the proposed public policies. The use of these evaluation methods, which are now fully accepted in orthodox economics, must therefore be encouraged.

6. AUTONOMIC LEGISLATION AND FORESTRY PLANS

This evaluation and diagnosis of Regional forestry policies is structured into three main aspects: the **legal framework** which is essentially the legal basis for these policies and strategies, the **structure and administrative organization** for the management of the natural environment in both territorial and functional terms, and finally the **plans, strategies and instruments for planning and management** that have been drafted to date by the Autonomous Community under their respective competencies.

6.1. THE LEGAL FRAMEWORK

The basic national legislation on forestry matters continues to be the 1957 Forests Act of 1957, despite the fact that under the 1978 Constitution there has been a formal commitment to draft a new basic law. Setting this constitutional commitment to one side, and although large sections of the Act are still workable, its age and pre-constitutional stigma make it somewhat obsolete, given that after more than 40 years in force, there is an obvious and reasonable need to adapt it to present criteria, trends and demands in political, economic and social terms, but above all territorial and ecological perspectives, which are now totally different from those at the time of its enactment. It is obvious that many circumstances and criteria for action have changed both within and outside Spain.



Since the approval of the 1978 Constitution, the Autonomous Communities have had the power to draft their own laws on forestry (Article 148.1.8^a) and nature conservation (Article 148.1.9^a), while respecting the basic national legislation (Article 149.1.23^a), which must still be based on the 1957 Forests Act.

Seven Autonomous Communities have decided to draft their own forest legislation⁵⁶ in order to provide their forestry policies with an updated framework. At present 10 Autonomous Community still lack an individual forestry law either because they consider the old legal framework to be acceptable or because they are waiting for the central government to draft a new basic national law which they will adapt to their own Regional circumstances.



Figure 8: Regional legislation⁵⁷

The legislation now in force on forest matters is included in Appendix III of this document. It is a faithful reflection of the desires by the Autonomous Community for change in the multiple functions of forest policy.

⁵⁶ Autonomous Communitys of Catalonia, Andalusia, Navarra, Valencia, Madrid, La Rioja and the Basque historic territories (See Appendix III).

⁵⁷ Until 1998



6.2. THE ADMINISTRATIVE STRUCTURE

The transfer of competencies to the Autonomous Communities by 1986 allowed them to establish their own management bodies for the transferred territory, although the process was by no means uniform. Some Communities have maintained a forestry body, others have established an environmental body that also covers forestry, while others have split the responsibilities between two organisations, one for the environment and another covered by the Agriculture Department. Furthermore, since the devolution of power there have been successive changes in these departmental structures, suggesting that the Region have not had a clearly defined idea about the optimum location of responsibilities for forestry matters.

Almost all of the existing Autonomic forestry strategies and plans coincide in mentioning this aspect, as well as the need to design a modern forestry administrative structure that is adapted to current needs. One such need is for a peripheral administration at the county level to draw the forestry technicians closer to the rural environment they manage, and to enable multiple forest uses to be included in rural development plans: population stabilisation, job creation and environmental conservation, in coincidence with the trends described by the working plan of the European Union's Forestry Strategy.

6.3. REGIONAL FORESTRY STRATEGIES AND PLANS

At present twelve of Spain's Autonomous Community have drafted documents on forestry policies or plans, along with the recently presented Castilla-León Forestry Strategy. All of these frameworks have been drafted in little over a decade since the pioneering Andalusian Forestry Plan passed in 1989.

In general, the objectives of these plans accept the principles set by international criteria. The strategies coincide in leading the administration and management of multiple usage forest systems towards an integrated and sustainable management of the natural environment, in which forestry aspects have an interdependent relationship with nature conservation.

Five Autonomous Communities have simply designed strategies which set out the shortfalls, needs and priority problems in their Region, as well as the basic guidelines for the main thrusts of action to resolve them, while lacking any quantified plans.

In contrast, another six Autonomous Communities have produced more detailed plans which also establish a validity period and an expiry date for the planned measures and initiatives and their corresponding budget, with short-term strategic initiatives and in some cases estimates of funding requirements. In the light of the latter, an average annual



investment of roughly 30,000 million pesetas per year is necessary, implying an average total annual budget for applications in forest areas of 10,000 pta./Ha. per year.



Figure 9: Regional strategies

The Canary Islands and Madrid Autonomous Communities lie between these two extremes. The former has only drafted and budgeted for some of the programmes in its Forestry Plan, while the latter has recently presented a Forestry Plan to the Regional Parliament, with ten sectorial programmes. Finally, there are four Autonomous Communities which do not have a forest policy that is defined by a planned framework.

The most ambitious plans are those of Galicia (in operation for the last 40 years and a budget of 25,567 pta./Ha. of forest per year), Asturias (in operation for 60 years, with a budget of 13,500 pta./Ha. per year) and Castilla-La Mancha (60 years of operation, 10,000 pta./Ha. per year). The rest of the plans are budgeted for shorter periods (10 years), primarily in Catalonia and Navarra, and have much more modest funding, which ranges between 4,000 and 5,000 pta./Ha. of forest per year. All of the above figures are in current figures for the year each plan was approved by the Regional Parliament.

Regardless of the degree of optimism or realism of the forestry plans and strategies, and the degree of budgetary fulfilment, the problems that have arisen seem to reside in two issues:

- ∄ The structural problems of the forestry industry, which are due in turn to two main causes: on the one hand, the long lead time inherent to any forest policy distances it from the immediate decision-making process and further still from the achievement of tangible short-term results desired by politicians for electoral purposes. This problem gives rise to small budgets and an isolation of the forest



administration bodies. In addition, the widespread lack of awareness of the forestry issues means that there is considerable ignorance about the real problems, leading to a lack of trust in the decisions made about forestry issues.

- € The short-term problems in general politics. Since the Maastricht Treaty of 1993, the convergence criteria have forced Member States to undertake budgetary cutbacks which, in the light of the above circumstances, could not be expected to exactly benefit the forestry industry. Furthermore, the 1993-1997 period coincided with the application of almost all of the Autonomic forestry plans, which largely explains their lack of completion.

Most descriptions of the structural problems in the majority of the plans coincide on at least two main points:

1. The lack of human and budgetary resources is a common shortfall diagnosed in every regional forestry plan.
2. In reality, the budgets for forestry plans, regardless of their long time span, can only be passed by Parliament for a one-year period. This means that while the plans envisage a review every 4-5 years, no firm commitments can be guaranteed in the medium or long term.

6.4. AN AUTONOMIC DIAGNOSIS OF THE FORESTRY PANORAMA

The plans and strategies of the Autonomous Communities analyse the present situation. Almost all highlight five decisive aspects:

1. Little weight seems to have been given to forest planning, management or restoration. The productivity of Spanish forests is considerably less than that of their potential. Despite the need for reforestation on land that is deteriorated and/or has serious erosion problems, there seems to be a much higher priority given to the maintenance and improvement of the existing forests, both public and private, especially the latter. In other words, silviculture takes precedence over forest reforestation.
2. Considerable impetus has been given to the protection of the natural environment, at least in the legal and institutional framework. This is, however, more apparent that effective in the light of the provisional nature of many protected areas. The necessary parliamentary approval of Natural Resource Management Plans has not proceeded, they have not been allocated funds, and they lack most of the necessary services.



3. The large percentage of Spanish land covered by some type of forests is tending to increase further as a result of the abandonment of low-yield or surplus crop and grasslands, as well as the reforestation of agricultural land and other reforms subsidised by the Common Agricultural Policy (CAP). This is leading to a heavy re-naturalisation trend in the country as it enters the new millennium.
4. Large areas of rural Spain are under serious threat of total abandonment, and one of the potential alternatives to prevent this is forestry. It must be stressed that the reforestation programmes on farmland and other specific measures such as the CAP agri-environmental schemes must have a priority focus on less-favoured zones. The development of forest expansion services and programmes within a planned framework at a county scale should be a key feature in the future.
5. Two thirds of Spain's forests are privately managed. This proportion can be expected to rise even further in the light of the fact that the expected increase in forest areas will primarily come about from the conversion of private farmland. This initially means that the forest strategies for the 21st. century should include a clear thrust towards private initiative through the backing, promotion and application of incentive policies for private forest management. This should not, however, mean that increases to the body of public forests should be opposed if they do not harming private interests.

Another important feature of the plans is the fact that certain Autonomous Communities have taken considerable steps forward in the dialogue between all of participants in the forest policies. The process that led to the passage of the Andalusian Forestry Plan and the trends in Catalonia in recent years are particularly encouraging.

From a Regional perspective, the national Government is ultimately expected to supplement the Regional policies, strategies and plans in a subsidiary and co-ordinated manner whilst undertaking its own responsibilities and acting as the international representative to optimise the channelling of the financial resources that may be available.

7. ACTION TAKEN BY THE NATIONAL FORESTRY ADMINISTRATION

All national Forest Activity has been undertaken in collaboration between the national and Autonomous Communities since the culmination of the process that led to the enactment of Article VIII of the Spanish Constitution on nature conservation. Under the respective Royal Decrees, responsibility, property, infrastructure and budgets were transferred from the national forestry body, called ICONA at the time, to the Autonomic Government Departments.



7.1. CURRENT INITIATIVES

7.1.1. Ministry of Environment initiatives

The Undersecretariat-General for Forest Policy, which is part of the Directorate-General for Nature Conservation and thus the Environment Secretariat-General is the unit responsible for policy co-ordination with the Autonomous Communities. In this process, the central Government still has operative responsibilities but no direct forest management powers at all apart from six areas outside National Parks which were not transferred and remained under the authority of ICONA first and since 1995 the Independent National Parks Board due to their specific value, their potential inclusion in a future National Park, or their use by the highest authorities of the nation. The main thrusts of this co-operative process are:

- ∅ Investment in forest hydrology, managed entirely by the former ICONA, under working arrangements with each Autonomous Community on hydrological matters. These powers are now the responsibility of the Directorate-General for Nature Conservation under the Ministry of Environment.
- ∅ Supplementary assistance for forest development and planning by private owners. This aid has been distributed amongst the Autonomous Communities, initially under national/Regional agreements and since 1998 under a decision by the Council of Ministers which territorialised the subsidies in compliance with Article 156 of the General Budget Act.
- ∅ Lines of work articulated jointly with the Autonomous Communities to monitor plagues, harmful agents and air pollution, a selection of basic material for forest reproduction material, the production of a forest map and inventory, and the collation of information on public forests for the a permanently updated Catalogue.
- ∅ Co-ordination with the Autonomous Communities on forest fires fighting. The activities include both aerial cover provided by the Directorate-General of Nature Conservation to the Autonomous Communitys for fire-fighting in forest areas, and the priority Action Plans against Forest Fires (PAPIF), drafted in co-operation with the Autonomous Communities, which include the Conservation Boundaries designed by each Autonomous Community.
- ∅ The development of detection, communication and prediction infrastructure for fire hazard and risk indexes using a network of operations centres for the co-ordination of aerial media and the existence of land extinction infrastructure in protected natural areas on public land.



- ∓ The set of projects aimed at developing fire prevention infrastructure, materialised in annual education and refresher campaigns as well as staff training courses in prevention and extinction techniques.
- ∓ The aerial fire fighting fleet includes amphibious and land-loading aircraft and helicopters. The purpose of this mobilisation is provide the Autonomous Communities with the necessary aerial cover, as well as to protect National Parks, mountains and other natural areas under the management of the Directorate-General for Nature Conservation. The human resources that can be transported to extinguish forest fires consist of five Rapid Reaction Brigades (BRIF, 250 members) and Rapid Reaction teams (CAR), composed of more than 150 operators who are placed at the disposal of the Autonomous Community to complete their human resource requirements.
- ∓ The III Priority Action Plan against Forest Fires (PAPIF3)⁵⁸ was designed on the basis of the achievements and experiences of its forerunners. The Plan, developed in co-ordination with the Autonomous Communities, which are responsible for the design of Regional Prevention Plans for counties under the greatest threat. This is a scheme of national subsidies aimed at funding fire prevention activities by the Autonomous Communities. The Plan was aimed at the creation of a mobile forest watch network, improving the infrastructure at the aerial bases, promoting fire prevention in public and private forests and co-ordinating volunteer groups to prevent and watch forest fires.
- ∓ Fight against desertification: The Lucdeme project (Fight against Desertification in the Mediterranean) was inaugurated in 1981. It devotes resources to basic research and methodology development projects in collaboration with universities and research centres in Valencia, Almería, Málaga and Murcia. When Spain ratified the United Nations Convention on Desertification⁵⁹ on 11 February 1996, the National and Autonomic Governments instituted a joint National Action Programme against Desertification (PAND). On the initiative of the Spanish Government, the struggle against desertification was included in the European Union's priority programmes under the Euro-Mediterranean Programme.
- ∓ The Directorate-General for Nature Conservation devotes a large part of its annual budget to research through agreements with Spanish universities and research centres.
- ∓ The Directorate-General for Nature Conservation, under agreements with Ministries and other bodies, carries out reforestation programmes on land

⁵⁸ Ministerial Order (MAPA) of 3 April 1996, which establishes the III Priority Action Plans against Forest Fires

⁵⁹ Signed in Paris on 17 June 1994



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managed by them, although it does not draft quantified objectives or manage reforestation formulae apart from within the forest hydrology policy.

- ∄ Finally, the recent ratification of the 1997 Kyoto Protocol on Climate Change has opened the way to another national function or responsibility in the co-ordination of information and definition of the role of forests as carbon sinks.

Amongst the above programmes, the Forest Fire-fighting Programme and the monitoring of the effects of air pollution in forests are at least partly funded by the European Union.

7.1.2. Initiatives by the Ministry for Agriculture, Fisheries and Food

When the Directorate-General for Nature Conservation was transferred from the Ministry of Agriculture, Fisheries and Food to the Ministry of Environment, part of the forest policy remained under the former body, primarily due to the need to be horizontally integrated in broader operational units. Other responsibilities remained because the continuity between farming and forestry zones of rural areas is by no means clear.

The former cases include the Divisions of Forest statistics (included in Farming Statistics), Forest Plant Health, although the Sub-Directorate of Forest policy has a Forest Health Service, the Cork Advisory Committee (CANCOR) and Research, given that the prestigious Forest Research Centre (CIFOR) is a technical unit of the National Institute for Agricultural Research (INIA). The latter cases include responsibilities for the management of reforestation programmes on farmland, management of funds and design of the rural development programme, promotion of certain forest crops (National Poplar Commission), structural action in mountain areas and, above all, “dehesas” (grazing forests) in the broad sense.

Brief reference must be made to the programmes managed by the Agriculture Ministry in collaboration with the Autonomous Communities due to their importance and impact on forest policy, as well as the management of the livestock grazing policy and forest harvestings mentioned in Section 3. While one of the main objectives is the integration of the forestry industry in the rural environment and economy, the policies of the Ministry in this broader area of rural development is of capital importance.

Afforestation of farmland

Under Regulation (CEE) 2080/92, which establishes a regime of subsidies to encourage forest investment on farmland, a pluriannual programme was approved for Spain in April 1994. This Plan has been widely accepted by the Autonomous Communities, and now Spain has the best results of all Member States. Until 31 December 1998, the total reforested area was 400,893 hectares in comparison with 108,564 hectares in Portugal, the second ranking country in the EU.



In addition to the significance of the area covered by the programme, other equally important aspects must be mentioned, including:

- a) The widespread acceptance of the measure by landowners. The number of beneficiaries is now more than 28,000 which is highly unusual for forest subsidies in Spain, where landowners tend to invest very little in the forestry sector.
- b) The largest afforested areas (over 72%) have been on grazed waste land, grasslands, and land previously occupied by low-yield cereal herbaceous crops. In other words, the plantations have been concentrated on the most marginal farmland
- c) A wide variety of trees have been used, both resinous (128,132 hectares) and broadleaved species (214,775 hectares). In areas where technically feasible, mixed forests with a higher ecological value (53,781 hectares) have been introduced gradually.

AFFORESTATION OF FARMLAND DATA FILE

Summary table of applications from the commencement of the programme until 31.12.98

A.- FORESTATION (Has.)- SUMMARY

I.	BROADLEAVED SPECIES	
	I.a-all slow-growth broadleaved spp. (pure stand)	116.166
	I.b-all slow-growth broadleaved spp.(mixed stand)	92.234
	I.c-all fast-growth broadleaved spp.	6.375
	I. TOTAL BROADLEAVED SPECIES	
	214.775	
II.	RESINOUS SPECIES	
	II.a-all slow-growth resinous species (pure stand)	80.843
	II.b-all slow-growth resinous species (mixed stand)	17.170
	II.c-all fast-growth resinous species	30.199
	II. TOTAL RESINOUS SPECIES	128.132
III.	MIXED SPECIES (BROADLEAVED x RESINOUS)	
	III.a- all mixed slow-growth broadleaved x resinous species	48.411
	III.b- all mixed fast-growth broadleaved species x resinous species	5.370



III. - TOTAL MIXED SPECIES (BROADLEAVEDx RESINOUS)	53.781
IV. OTHER TREE AND/OR SHRUB SPECIES	
IV. Total other tree and/or shrub species	4.205
TOTAL AREA PLANTED UNTIL 31.12.98	400.893

B.- IMPROVEMENT OF CORK STANDS AND OTHER FORESTED AREAS

	<i>TOTAL</i>
V.- Regeneration and improvement de cork stands (Has)	82.405
VI.- Silviculture work (Has)	65.990
VII.- Firebreaks (Has)	6.173
VIII.- Water access (Units)	1.055
IX.- Tracks (km)	5.253
X.- Fencing	2.060

C.- AFFORESTED FARMLAND (approximately)

	<i>%</i>
C.1 – Land used for herbaceous crops	22,70
C.2 – Fallow and other unused land	9,87
C.3 –Family vegetable gardens	0,17
C.4 – Land used for woody crops	4,18
C.5 –Natural meadows	0,68
C.6 – Grassland	14,58
C.7 – Cork stands	0,36
C.8 – Open forests and dehesas	13,01
C.9 – Grazed waste land	34,44
Total	100,00

	<i>TOTAL</i>
C.1 – Land used for herbaceous crops	91.016
C.2 – Fallow and other unused land	39.571
C.3 – Family vegetable gardens	676
C.4 – Land used for woody crops	16.770
C.5 – Natural meadows	2.723
C.6 – Grassland	58.463
C.7 – Cork stands	1.451
C.8 – Open forests and dehesas	52.172
C.9 – Grazed waste land	138.088
Total	400.930



Livestock tracks

Spain has a unique network of livestock tracks used for seasonal migration, made obligatory by the seasonal nature of the country's pastures. This network and the associated cultural features are an historical legacy of great importance. Although seasonal migration has been in decline in recent decades, the different classes of tracks (*cañadas*, *cordeles* and *veredas*, each one with its standard width) constitute a mesh of tracks totalling more than 125,000 km in length and 425,000 hectares in area throughout the Iberian Peninsula. These are true biological and cultural corridors which permit the interconnection of geographically distant areas and a genetic exchange between distant populations, with an ecologically enriching result.

Transhumance also has other effects on the environment:

- ∕ It prevents overgrazing of the exhausted source pastures.
- ∕ It enables the growth cycle of certain parasites to be broken when the livestock leave the farm during summer.
- ∕ It prevents shrubbery formation on pastures used for seasonal migration and impedes summer forest fires.

There is also a growing social demand for the use of these stock routes for other socio-cultural purposes which encourage contact with nature. Transhumance thus provides these forest areas with a multifunctional utility which has been acknowledged by the Livestock Tracks Act 3/1995.

The Act stresses that the livestock tracks are the public property of the Autonomous Communities, which are provided with the widest possible powers for their conservation, protection, creation, extension and establishment in their respective regions, with the exception of cases in which the livestock track runs between two or more Autonomous Community and also those livestock tracks which serve as a link for cross-frontier livestock movements.

The Livestock Tracks Act envisages the possibility of the Ministry for Agriculture, Fisheries and Food instrumentalising financial assistance and providing technical assistance for any activities with the same purpose in order to co-operate with the Autonomous Communities in the conservation of this part of the national heritage.

7.2. INTERNATIONAL INITIATIVES

In its role as co-ordinator with the Autonomous Communitys and representative of Spanish forestry interest in international forums and organisations, the Directorate-General for Nature Conservation undertakes a series of regular activities:



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- ∄ Reports on results or state of activities of projects covered by the Conventions on Hydrological– Forest Restoration, partly financed by European Union structural funds.
- ∄ Selection and presentation of projects with EU funding under the Forest Conservation Regulations: Regulation (CEE) 2157/92 and successive Regulations against Air pollution and Regulation (CEE) 2158/92 against Forest Fires.
- ∄ Supply of data bases, results and reports from the European Monitoring Network on Forest Damage, Level I and the Network of Plots for Intensive and On-going Monitoring of Forest Ecosystems Level II.
- ∄ Participation in the Common European Catalogues and the OECD⁶⁰ on Basic Material for the Production of Forest Reproduction Materials.
- ∄ Supplying the European Union with advances of annual figures, reports and data bases on forest fires.
- ∄ Referral of the Forests Questionnaire to the Environmental Policies Committee of the OECD and the Statistics Office of the European Communities (EUROSTAT).
- ∄ Forwarding the Forest questionnaire for the inclusion of Spanish figures in the UNECE/FAO Timber Bulletin ⁶¹ .
- ∄ Final annual figures on production and consumption of forest products, advance of current figures and predictions for the coming year for the UNECE Wood Committee.
- ∄ Advice to the Autonomous Communitys and presentation to the European Commission of requests for subsidies to finance projects using Community funds related to forest conservation against air pollution (Regulation CEE n° 2157/92), and forest fires (Regulation CEE n° 2158/92)

In addition, a large volume of non-periodic information and questionnaires are sent to the European Union, FAO, UNECE, Coordination Unit of the Ministerial Conference on Forest Conservation in Europe, the UN/CSD⁶² and many other international bodies.

Spain's presence and participation in international activities and negotiations is growing at the following levels:

- ∄ Bilateral Iberian contacts on different aspects of collaboration to improve Spanish-Portuguese co-ordination and adopt common positions in negotiations with third countries as Mediterranean Member States of the European Union.

⁶⁰ *OECD: Organization for Economic Co-operation and Development*

⁶¹ *UNECE: United Nations Economic and Social Committee- Economic Commission for Europe; FAO: UN Organization for Food and Agriculture.*

⁶² *UN/CSD: Committee for Sustainable Development, under the UN General Assembly*



- € Presence and participation in the Permanent Forest Committee of the European Union and in the meetings sponsored by the Council to debate forestry issues. Spain is working actively on the European Forestry strategy and the Rural Development Regulation which will result in the CAP reform envisaged in Agenda 2000.
- € Pan-European debates, primarily under the auspices Ministerial Process on Forest Conservation, which aims to apply and deepen the concept of sustainability in continental Europe.
- € United Nations forums, both those specialised in forestry issues such as the FAO Forests Commission, the UNECE Wood Committee, etc., and also the IPF/IFF process⁶³, a multilateral forum whose ultimate goal to date has been to produce a global instrument on forests. Spain has recently taken a high profile in its commitment to organise the European stage of the initiative for the technical studies prior to deciding whether or not to negotiate the Forestry Convention.

In addition, the Directorate-General for Nature Conservation in co-ordination with the Spanish International Co-operation Agency and the FAO/Silva Mediterranean Network provides technical assistance to developing countries to improve and organise their forestry and nature conservation activities.

8. THE EUROPEAN UNION

The Treaty of Rome (Rome 1957) was initially conceived in a period of strong European economic growth. It embodied a clear mercantile approach and paid little attention to environmental problems. The former EEC did not try to define a common forest policy because from the outset, its six original members were largely self-sufficient in agricultural produce but had to import half of their timber products and by-products consumption, which detracted from the sense of organising the timber market.

In spite of reiterated initiatives by the European Parliament, to date the Council and the Commission have been reticent to produce a common European forest policy. Instead, successive fringe structural measures have been produced to support development in mountain areas, isolated forestry measures with a simple agricultural focus, combinations of isolated and dispersed regulations, accompaniment environmental measures for the reform of agricultural markets, or supplementary measures for environmental policies.

In summary, to date the European Union has designed residual measures and initiatives from other industry policies, primarily agriculture, but not a true strategy focused on forestry. The European forest policy is thus at a critical stage, with a very modest balance

⁶³ IPF/IFF: Intergovernmental Forum/Panel on Forests, responsible to the CSD, where the global forest dialogue is being conducted.



due to discrepancies between Member States, the Council, the Commission and the European Parliament that reflect other structural differences. These include:

- € Profound differences in natural and social conditions between the States of the Union.
- € A powerful North – South gradient in forest productivity, conservation values and degrees of threat. This gradient is not entirely linear: productivity increases southwards to the Pyrenees – Alps barrier, and is thus more a northwest-southeast gradient, changing radically when it reaches the south facing slopes of the Pyrenees and the Alps from a steady increase to a sharp drop with the accompanying increase in the fire hazard.
- € Easy supply of the European production shortfall on the international wood market at low prices.
- € Little social or political awareness of the indirect, non-commercial benefits of forests which are, moreover, intangible at market prices.

8.1. COMMUNITY FOREST LEGISLATION

European forest law is not a block regulation aimed at applying a well-defined forestry strategy. Until the CAP reform, the European Union chose instead to regulate certain partial aspects through either direct assistance to the generators of certain forest products in the Member States, or structural assistance aimed at rural development programme funds. In 1989, the European Parliament passed the ‘forestry package’ covered by Regulations 1609 to 1615, which cover a range of forestry aspects from production subsidies to the creation of the Permanent Forestry Committee in the Council, which together form the above-mentioned combination of dispersed measures.

In 1992, the Council set up the farmland reforestation programme, which was aimed at withdrawing excess agricultural production by means of tree planting and the maintenance of existing masses of trees, both subsidised by the EU. The introduction to Regulation 2080/1992 shows that originally, these were ‘...*accompaniment measures aimed at sustaining farm produce markets...*’. Since then, however, the reforestation of farmland has been included in the Declaration by the Commission on a European Union Forestry Strategy, and since its inclusion in Chapter VIII on Silviculture, in the Rural Development Regulation.

8.2. APPLICATION OF THE STRUCTURAL FUNDS

In 1988, the former national conservation body ICONA started to become involved in a series of Programs co-financed by the European Union Structural Funds (EAGGF⁶⁴-

⁶⁴ *European Agricultural Guarantee and Guidance Fund*



Orientation and FEDER⁶⁵). In 1993, a new line of funding was opened via the Cohesion Funding Instrument.

The Community Support Framework 1994-1999 saw the continuation of the previous programmes within development line 4 (Agriculture and Rural Development) Objective 1 regions were initially assigned 47,000 million pesetas for conservation and improvement work on the natural environment, to be funded by EAGGF-Orientation with a subsidy rate of between 70% and 75%. Regions with Objective 5-b zones, were allocated almost 20,000 million pesetas with a reimbursement by EAGGF-Orientation of between 45% and 50% of public expenditure.

On 16 May 1994, the Council of the European Union passed Regulation (CEE) 1164/94 to establish the Cohesion Fund, which channels financial support for environmental projects and thus forestry projects with a nature conservation thrust. In 1997, however, the Treasury Ministry vetoed this source of funding for forestry projects for technical reasons.

In addition to these EU projects, there are others contemplated in Regulations 2157/92 and 2158/92 on forest protection against pollution and fires, the Financial Instrument for the Environment (LIFE) under Regulation 1973/92, and the CORINE programme. These initiatives lie in the framework of programmes funded by EAGGF-Orientation and, until 1997, by the Cohesion Fund under which investment projects for Objective 1 and 5-b Regions are eligible for investment reimbursement.

8.3. NEW PERSPECTIVES: THE EUROPEAN UNION FORESTRY STRATEGY

In spite of the background and impediments discussed in previous sections, in January 1997, the European Parliament used its new powers under Article 138 of the Maastricht Treaty to pass a Legislative resolution⁶⁶ urging the Commission to draft a legislative proposal on an EU Forestry Strategy by the year 2000.

As a result of this obligation, the Commission has drafted a work plan to design a European Forestry Plan for the 21st century in accordance with the current international criteria and agreements. The basic objectives are to ensure that the concept of rural development includes the concepts of multifunctionality and ecological, economic and social sustainability of forests (agricultural-forestry or multifunctional silviculture systems) with the threefold purpose of stabilising the rural population, creating new jobs (new sources in rural areas) and protecting the environment.

⁶⁵ *European Regional Development Fund*

⁶⁶ *A4-0414/96 (DOCE C 55 de 24/2/97)*



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This European Forestry Strategy was presented as a Communication by the Commission to the Council⁶⁷, which in turn passed an accompanying Resolution on 15 December 1998 to forward to the Parliament.

The programme objectives distinguish different management areas including the co-ordination and support for the forest policies of the Member States, the exterior forest policy of the Union and, above all, the need to design a new system of institutional and financial support to organise the current dispersal of administrative and budgetary responsibilities with effects on the forest policy, and strive towards legislative and financial harmony. As a consequence of the latter objective, the Commission has drafted a new Regulation on Rural Development, at present under debate, which groups all of the dispersed CAP accompaniment regulations, structural funds and agri-environment schemes that are applicable via three objectives and a single programme per Region, as well as envisaging a new specific financial instrument: the EAGGF-rural fraction. It is now common knowledge that this Regulation will include a specific chapter on forest policy to gradually merge the sector into the CAP. Along with the European Strategy, this Chapter (VIII) will form the core of the incipient European Forest policy.

9. FORESTRY RESEARCH

Forestry research must provide answers for an industry with serious difficulties in identifying its R+D needs. The public sector is vitally important in this area because of the indirect benefits that forests provide to the whole society, the relative importance of public property where the best preserved forests are found, and also because of the still incipient industrial organisation of forested areas on private property.

The industrial facet of the forestry sector, apart from the cellulose and hardboard industries, has little independent capacity to assimilate new technologies, or even to gain access to information about the state of R+D in its own field. It has an even smaller capacity to develop research projects that might improve its technology and environmental practices.

The responsibility for identifying needs and promoting forestry R+D lies with the relevant government departments, the proprietors of forested areas and the forestry industry, which has sub-sectors with little or no mutual integration and thus incapable of taking part in R+D initiatives. Thus, the demand for innovations has not taken the lead it should have in pointing the way for forestry research programmes. This only increases the sense of uncertainty in a structurally weak sector.

The present structure and organization of Spanish forestry research is the result of three processes that have arisen since the establishment of the Autonomous Communities, which began to work on the basis of a previously unitary national research system with little territorial development. These processes were the devolution of research areas to the Communities, the uptake of forestry issues as research subjects by universities and the

⁶⁷ COM (1998) 640, of 18 November. The text is included in Appendix VIII.



National Scientific Research body (CSIC), and the creation and reorganisation of an agricultural and forestry research system by the Autonomous Communities themselves.

After the transfer of responsibilities to the Autonomous Communities, the National Institute for Agricultural Research (INIA) maintained forestry research throughout the country from its head office. Under INIA, this research is now conducted by the Centre for Forestry Research in the Department of Sustainable Use of the Natural Environment and other multidisciplinary Departments.

The forestry research conducted INIA has accumulated a considerable amount of laboratory infrastructure and a large number of experimental plots, in collaboration with DGCONA and the Autonomous Communities, used for production tests, the analysis of sources and progenies of the main species, monitoring the health of forests and the study of Spanish ecosystems.

The Centre for Forestry Research in Lourizán (Pontevedra) is funded by the Galicia Autonomous Community and conducts research along the Cantabrian coastal belt in collaboration with other regional organisations.

As a consequence of the reorganisation of agricultural, forestry and environmental research, research units or forest technology centres have been established in the Autonomous Community which in some cases are still in the growth and consolidation phase.

There are also important research groups in the tertiary Schools of Engineering and Forestry Techniques (fundamentally under the Madrid Polytechnic University) and the CSIC (in Madrid, Salamanca, Jaén, Almería and Barcelona). Several faculties of Biology, Pharmacy, Geography, History and Economics all have teams working on forestry research in relation to economics, natural and social sciences.

Private initiative must not be overlooked. For several years, private bodies have participated in R+D programmes such as rapid-growth species improvement.

Although the number of R+D seems to be large, in most cases they are so small in terms of human composition that they cannot reach the critical mass to become competitive. Co-ordinated action would enable them to join forces to resolve the highest priority problems. Some areas of forestry research such as the ecology and systems dynamics of forest resources, silviculture, genetic improvement, sustainable management and conservation of forest resources are backed by an acceptable number of researchers. Others have never reached critical mass or have lost it, as in the case of forest hydrology, exploitation, economics, sociology and others.

Forestry centres such as the one in Lourizán (Pontevedra), Valonsadero (Soria), CIFOR, those under the CSIC and small forestry research groups such as IRTA in Catalonia, CTCF in Solsona, CEAM in Valencia, which has maintained a line of forestry research since 1991, CIDE, also in the Valencia Region, with its work on desertification, CREAM in Barcelona and other smaller centres under SIA (Extremadura), SIA (Aragon) and another in



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Navarra and the Basque Country have a relatively good structure but serious deficiencies in research staff, which makes them less efficient and competitive. These efforts should be co-ordinated with the work of companies and other private bodies, also worthy of promotion.

Specific work on forest health is done in co-operation between the Directorate-General for Nature Conservation and the Department for Sustainable Use of the Natural Environment of INIA, the Valencian Institute for Agricultural Research (IVIA), the Centre for Mediterranean Environmental Studies Foundation (CEAM) and the National Museum for Natural Sciences (CSIC). In Addition, under an agreement with the Aragon Regional Government, a laboratory is maintained where new methods for controlling forest pests are developed.

CIFOR-INIA, the heir to the former Forestry Research and Experimental Institute, has a substantial laboratory infrastructure and a large network of permanent experimental plots installed in 1960 and maintained to the present day, albeit under increasing difficulties due to lack of staff and funding.

If this network of plots were to be supplemented with others, possibly established in collaboration with the Ministry of Environment and the Forestry Services of the Autonomous Communities, they would be able to provide a wealth of data and knowledge which, if properly processed and analysed, would be the largest possible base or starting point to relaunch forestry research in Spain.

The research objectives mentioned in the current Spanish Research and Development Plan, under the *National Programme on Forest Systems and Resources*, managed by INIA, are the following:

- š Identification, inventory and eco-functional analysis of forest systems
- š Management of forestry systems and resources
- š Conservation and protection of forest resources
- š Creation, transformation and improvement of forest systems
- š Characteristics and properties of forest products and equipment technology

10. OTHER PROBLEMS IN SPANISH FORESTS



Many of the problems related to Spanish forests are described in previous chapters. Other equally if not more important problems have not been included in previous descriptions due to their general nature. These are described below.

10.1. EROSION

In Spain, water-borne erosion is the most obvious symptom of the desertification process. It causes the loss of fertile soil which is vital to maintain the bioecological potential of the land and is accumulated additional effects by diverting natural riverbeds with where it is not necessary, producing sediments and land- slides of solid matter, and causing floods that are often catastrophic. *Land deterioration arid, semi-arid and dry sub-humid zones due to many factors such as climate change, human action*⁶⁸ and other effects, destroys the production capacity of soils.

Any analysis of denudation must consider water, soil and vegetation resources as an inseparable part of the drainage basin. These resources are part of a complex system integrated territorially in the basin and part of the water cycle in which any disturbance can have serious effects on the system as a whole.

The importance of forests lies in the fact that they are located in geographically strategic positions in the river basins, primarily in the headwaters and middle reaches with the steepest relief and the highest rainfall and water levels. This raises the role of forests as the most highly evolved system of these areas and the component that retains water and soil and prevents or drastically reduces erosion.

The existence of forests thus helps to protect the basic soil and water resources and regulate the water cycle, an essential process in the system. Bare soil due to a lack or scarcity of vegetation, steep slopes in a large part of the country and an irregular distribution of the Spain's intense rainfall has resulted in a rapid spread of denudation

Geological erosion is a natural process that has been occurring since the Earth was formed. Its intensity is known to depend on the interaction of a large number of factors including: the type of plant cover, the volume and intensity of precipitation, the topography of the land and the type of soil. Human action can have positive or negative effects on plant cover, depending on the type of vegetation management and the slope gradient, which may be reduced by means of the construction of appropriate hydrotechnics.

Forest and shrubbery are important for soil conservation, water regulation, flood prevention, air quality preservation and maintenance of genetic resources. The vegetation cover not only protects the soil from the direct impact of raindrops. The accumulation of plant matter, the open structure of the topsoil and the sponging effect of the lower levels due to the root systems all facilitate water infiltration and slow down surface runoff, reducing flood waves and ultimately disactivate torrential phenomena.

⁶⁸ *UN Convention against Desertification, ratified in Paris in 1994*

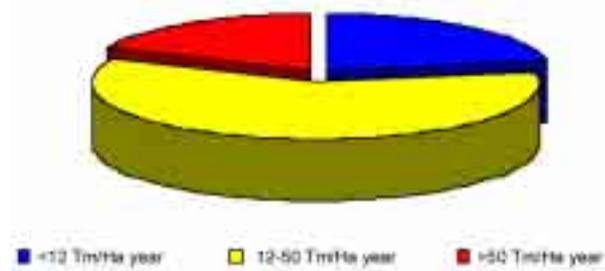


Figure 10: Erosion intensity⁶⁹

A total of 18.2% of Spain has annual soil loss rates above 50 T per ha. This means that 9,161 million hectares of Spain require priority action to prevent this heavy loss, more than 90% of which is concentrated in Mediterranean areas⁷⁰. This land lies in deteriorated forests with a defective stand density, shrubbery and grassland with little cover and composed of unstable associations. It is also found in cropland on hillsides, primarily woody crops. Action must therefore be taken on deteriorated shrubbery, grasslands and grazed waste land. In the Atlantic zone, such work on forest stands has a somewhat lower priority.

10.2. FOREST FIRES

Forest fires worsen erosion and destabilise forest ecosystems. Fire now has a heavy impact on Mediterranean forest stands. Long summer droughts accompanied by high temperatures and strong winds contribute to extremely dry conditions in the vegetation with serious consequences when a fire breaks out.

Year	Area affected by forest fires				
	Trees	Dehes	Scrubland	Pastur	TOTA
1990	72 923	5 535	104 10	20 411	203 03
1991	110 806	8 039	100 24	28 235	200 31
1992	40 438	2 556	57 099	5 155	105 27
1993	33 421	1 576	40 806	5 439	89 332
1994	250 433	17 883	143 24	36 056	437 613
1995	42 389	1 220	91 635	6 206	141 347
1996	10 632	1 353	42 380	5 545	60 828
1997	21 326	482	72 148	4 147	98 503

Table 21: Forest fires (Ha)⁷¹

⁶⁹ National Erosion Status Map

⁷⁰ Study of hydrological-forest restoration and erosion control (ICONA, 1991)

⁷¹ Forest Fire Fighting Service, Ministry of Environment



For several years, Spain's forest and other wooded lands have suffered heavy attacks on their vegetation cover, largely due to forest fires. Forest plans lack almost any degree of viability if the fire problem cannot be contained within acceptable limits. In some Mediterranean regions, fire has totally outstripped all predictions of forest growth, reducing the nature conservation and protection achievements by Government authorities to a minimum.

The intensity of fires in the last two decades has increased due to several socio-economic causes, including:

- a) Farm abandonment. This socio-economic trend is caused by the urban drift phenomenon, which is more intense in the north and west of the Mediterranean Basin. The abandoned land is colonized by pioneer species such as conifers and shrubs. The consequences are continuous, dense, even-aged stands without any sort of management.
- b) The economic policies that encourage this abandonment. Their aim is to reduce surplus farm produce without promoting parallel programmes of preventive silviculture with large enough budgets to pay for the removal of accumulated fuels.
- c) The continued use of traditional agricultural and pasture burnings. The reduction of grazing livestock herds leads to less control of the vegetation, and thus farmers use the same tool that has been employed for centuries to maintain their pastures: fire.
- d) The poor usage of forested areas by the urban population, either as recreational visitors or to build holiday or permanent homes. This inappropriate usage multiplies the probability of fire outbreaks (barbecues, rubbish tips, power lines, etc.), while also increasing the damage to human lives and dwellings located on the boundary between forests and urban land.

The high standard of fire fighting efficiency and technical resources achieved in the last decade has enabled the impact of fire to be reduced somewhat, although paradoxically, this is leading to a further accumulation of fuels in abandoned areas.

The number of fire outbreaks is on the increase in both Spain and the other Mediterranean Member States of the European Union. Most of these outbreaks come to small fires (less than 1 Ha), but the large number of them often stretches fire-fighting means to the limit, forcing a constant increase in investment.

Very few outbreaks (annual average: 0.2%) become large-scale fires (more than 500 Ha) with serious environmental and financial losses. Weather conditions affect the type of fire, as does the continuity of fuel and the application of fire fighting techniques that are inappropriate to forest environment.

Several Government schemes have been established to compensate for fire damage. Royal Decree 2329/1979 of 14 September, which passes the Regulation for the application of



the Combined Farm Insurance Act 87/1978 of 28 December, states in Article 45 that the '*In the case of forest fires*', the Insurance Compensation Consortium '*shall act as the direct insurer when the forest area owner proves that he/she is not covered by insurance, as stipulated in Act 81/1968, of 5 December and Decree 3769/1972 of 23 December.*' The latter Act established the Forest Fire Compensation Fund which was later included in the Insurance Compensation Consortium. This system did not, however, go beyond the establishment of insurance cover for those called on to collaborate in fire fighting duties.

10.3. PHYTOSANITARY PROBLEMS IN FORESTS

One of the basic management aims for forest areas is to maintain their vigour. Plagues, diseases produced by fungi and damage by adverse weather conditions have been the most harmful factors in this respect. The 1997 report on the state of Spanish forests testifies to the fact that this is still a serious problem.

Air pollution problems have complicated the chemical treatment panorama in Spanish forests. In the 1970's, a weakening problem from an unknown source became apparent in the forests of many industrial countries. Air pollution was widely accepted as possibly being one of the triggering agents that facilitated attack by plagues or pathogens and reduced the resistance of trees to adverse climatic factors such as drought and frost.

Since 1987, annual inventories on the state and trends in the health of forest areas have been prepared throughout Europe. This systematic inventory provides an overall view of the health of European forests and enables critical areas to be pinpointed. Spain has 450 monitoring points in this pan-European network, as well as another network of intensive monitoring plots in the main forest areas. These 53 plots representing the country's main forest systems are used for in-depth analyses of the role played by air pollution, climate and harmful biological agents on the health of forests.

The problems caused by drought in recent years, recorded precisely in the annual inventories carried out in the networks, warn us of the need to apply buffer measures against the potential climate change and the need to take preventive methods to avoid the proliferation of opportunist noxious agents. The use of these methods in silviculture is considered to be vital for proper forest management.

In addition to these two networks, the national Government, in collaboration with the Autonomous Communities where necessary, has other general types of networks such as the damage monitoring network in National Parks and forests, and specific networks like the drought damage monitoring network, (over half of the country affected), and the health of juniper and fir stands, which are becoming weakened for unknown reasons, or the monitoring of new damage to the Jerusalem pine which has appeared in a dispersed form almost everywhere that the species is found on the Iberian Peninsula.



10.4. PRODUCTION AND USE OF FORESTRY REPRODUCTION MATERIAL

The success of reforestation in terms of adaptation and profitability of Spain's future forests largely depends on the correct choice of the origin of the reproduction material to be used (seeds and plants) and its appropriate genetic and physiological quality.

Due to causes such as forest fires, pests and diseases, genetic contamination from nearby reforestations, etc., certain species are threatened with extinction.

Forest Genetic improvement is a fundamental element for the appropriate development of preservation, recovery and extension of forest areas. The features of the Mediterranean area where the majority of this material is destined makes it necessary to use plants that can withstand stress and drought and to carry out quality and adaptation tests in order to guarantee success of the reforestation.

As a consequence of the adaptation to European legislation on the sale of breeding material, a series of monographs was published by ICONA from 1991 to 1999 on the source regions. The species examined were *Pinus nigra*, *Pinus sylvestris*, *Quercus suber* L., *Quercus robur* L., *Quercus petraea* (Matt) Liebl, *Quercus humilis* Miller, *Quercus ilex* L., *Pinus pinaster* Aiton, *Pinus halepensis* Mill., *Fagus sylvatica* L., *Pinus pinea*, *Pinus canariensis* Chr.Sm. ex DC and species in the *Abies*, *Fagus*, *Pinus* and *Quercus* genera.

10.5. LACK OF SOCIAL CONSENSUS ON MULTIFUNCTIONAL AND SUSTAINABLE FOREST MANAGEMENT

The sensitivity of Spanish society towards environment-related problems has changed since the second half of the 1970's. This trend, which has refreshed the people's ancestral environmental memory, i.e., drawing them back to their natural environment, has largely been due to the environment movement. By now, almost all political, economic, legal, social and even industrial attitudes contain some degree of environmental parameters.

In response to this cultural change, forest management has evolved away from what was initially a balanced principle, i.e., managed, sustained harvesting as the basis of work by forest administrators, as reflected in the Forest Act of 1957. Subsequently, the trend has passed through a unifying stage between 1957 and 1975, when regulations governing protected natural areas were integrated in the forest legislation, towards a clear distinction between ordinary forests areas subject to specific forest legislation and those areas which are also under special supervision due to their ecological or landscape features, fully encompassed by legislation on protected natural areas as expressed in Article 9.2 of Act 4/1989. However, not even this differentiation has produced the necessary balance and consensus. The different social appraisal of the results of reforestations is one example. This



lack of consensus has arisen because in spite of the response by forest management authorities to these cultural changes, there has been little dissemination or acceptance of the idea that multifunctional and sustained management in accordance with internationally comparable parameters must be put into practice, not only in certain protected areas or ecologically sensitive forests, but in fact in all forests in accordance with their specific features and regardless of the different forest policy models adopted by each Autonomous Community.

This distinction has not, however, reduced the ubiquity of the widely accepted idea that all forest areas are intrinsically natural land, which has led to a strong push for nature conservation initiatives. The persuasive power of environmentalist groups can also be seen in the growing sensitivity towards the value of emblematic trees.

In Europe, ancestral interactions with local communities have led tree formations to be regarded not only as natural ecosystems but also as cultural and social systems. Man is also part of nature, and this has led to the preservation of just a few remnants of truly natural forests, in contrast to the trend on other continents. The socio-economic perspective of the rural environment must therefore be included in the planning and sustainable development of our forest systems.

The Spanish Forestry Strategy should be the basis for discussion forums to work towards social consensus in full awareness that man, especially in rural areas, is also a part of nature, and is now under serious threat in the 21st century, as seen in the accelerating rural depopulation trend.

Debate has sometimes been conducted in an exacerbated environment of criticism and widespread mistrust of forestry work. There is an need to also foster an awareness of forestry in debates that should lead to a consensus to pull Spain's forests out of their current fringe position in social, political, institutional and budgetary considerations.

Consideration of forests as a diffuse heritage of all will help to safeguard their survival, but it will also be necessary for this to be accepted directly or indirectly by those on whom the protection of forests ultimately depends. In this respect, county and community-level organisations play a fundamental role. In addition, apart from considering forests to be in the general interest, it must not be forgotten that forests have proprietors. In Spain and the rest of Europe, the majority are privately owned, and thus these owners must be taken into consideration and incentivated to maintain, improve and manage their forests in a sustainable way if the public interest that they undoubtedly represent is to be guaranteed.

The economic consideration of forests is unavoidable and necessary for the maintenance of forests systems in an acceptable condition to avoid their decline. Sometimes the lack of internationally comparable indicators has been the cause of incomprehension within the country.



For unfathomable reasons, while Spain adopted the Resolutions of the Ministerial Conferences on Forest Conservation⁷², the process was officially considered to be an outside issue and the requirements contained in the Resolutions were not included in the internal management levels at an operative level.

The recently relaunched universalisation of Sustainable Management Criteria in the Guidelines for Sustainable Forest Management at the Operative Unit scale, and the Sustainable Management Criteria and Indicators for Forests were passed at the III Ministerial Conference in Lisbon in June 1998. This is a new opportunity to join the international movement by creating forums for debate in which the sustainability of Spain's forests should become a reality based on consensus and not a cliché in one sense or another.

10.6. FOREST PROPERTY: THE EFFECTS OF THE MULTIPLE LEGAL CATEGORIES OF FORESTS ON MANAGEMENT TECHNIQUES

The majority of Spain's forests (66% overall) are in private hands. The rest are divided between different governments, with a clear predominance of local governments whose management competencies are now practically non-existent given that their forest areas are managed by the Autonomous Communities⁷³. More land is being added to these forest areas from zones that have been planted with a variety of crops in recent years but which, due to their intrinsically low productivity or because their owners have joined set-aside or tree plantation schemes, are now increasing the percentage of private forests, which must be managed as such until the subsidy contract expires.

The Forestry Strategy cannot overlook the historical fact that the Spanish forest policy has been based on categories designed specifically to articulate the great achievement of the forestry administration: to safeguard Spanish forests from demortization through the Catalogue of Public Forest Areas.

Cataloguable forests, originally those composed of certain species (oaks, beech and pines) of more than 100 Ha., and now public forest areas declared to be in the Public Utility due to a certain feature such as their ecological or protection functions⁷⁴, became the focus of forest policy to the point that these public forests are almost the only ones governed by the Forest Act of 1957, apart from forest harvesting on privately owned forests as defined by Articles 29.1, 30.1 and 2 of the Act.

⁷² *Strasbourg 1990, Helsinki 1993 and Lisbon 1998, see Introduction.*

⁷³ *See property distribution tables in Part One*

⁷⁴ *a) those in the headwaters of river basins; b) those that serve to efficiently regulate large-scale alterations in water levels from rainfall; c) those that prevent land or rockslides, impede soil erosion or defend towns or crops; d) those that clear up swampland; f) in general, forest areas which by size or location are worthy of conservation or replanting due to their economic influence, public health, water regime, soil security and fertility or utility for national defence purposes.*



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Post-Constitutional Autonomic legislation still places emphasis on these forests, although in some cases the categories have been broadened to include hydrogeology and proximity to population centres, as in the case of the law in Catalonia. In other regions such as Navarra, the Catalogue of Public Forests includes those over which a public body has canopy rights, and others such as Andalusia and Valencia have coined the category of 'Forests in the Public Domain'.

Private forests have only really been regulated since the start of the 20th century in cases where they were declared to act as protection for river catchment basins, and in every case under low-status regulations with the exception of the Protection Forests Act, which is generally impossible to apply due to its complexity and lack of financial resources. In fact, the 1957 Forest Act only devotes two articles to private non-protective forests, while the 1962 Forest Regulation devotes several articles to this classification. Article 230 bestows the power of discretion on the heads of Forestry Services in forests composed of slow-growth species, with the power of Service staff to tree marking when advisable. Autonomous Communities' laws have extended the regulation to protection private forests in cases covering large areas (Navarra and Valencia), and in some cases a parallel catalogue of protective private forests has been established (Navarra, Valencia and Catalonia).

The official forestry services, previously ICONA and now under the Autonomous Communities, have maintained a public policy and administrative powers over public forest policy-making, promotion and service which does not distinguish between forest policy and the management of the forest heritage. Indeed, investment (promotion and public services) focuses on the latter aspect. The forest policy that can be applied to private forests has in most cases been reduced to a question of details, i.e., permits for felling, pruning, etc. The private sector regards this power of marking an excessive right to supervise private initiatives.

In summary, the Autonomous Communities have either overlooked these legal categories of public forests, Protection, Utility Public Forests, etc., or they have been extended to the point where they are practically unrecognisable in order to match the new forestry policies that emphasize the general interest served by all forests, both public and private, according to which the government intervention is graduated. Furthermore, there is no specific framework to regulate private forest areas that are neither protection, nor of social importance, nor located in protected zones, apart from the above-mentioned exception of harvestings.

The Forestry Strategy must consider that now there is no sense in basing all regulations on legislation which, amongst other defects, bases control and financial incentives on ownership categories which since resolution L1 signed at the Lisbon Conference, is not fully applicable.

Nevertheless, the fact that the boundaries of Public Forests coincide with officially protected natural zones, to the extent that many of them coincide with land that has not undergone urban or rural development, or with potential ecological corridors, islands or green



belts, suggests that the total abandonment of the category without replacing it with alternative classification would pose a serious threat to nature conservation and the forests themselves.

It is also important to note that the Catalogue of Public Utility Forests also serves essential legal functions for government administrators, such as the assumption of possession or the regime of non-embargability, inalienability and imprescriptibility. If it were to be deleted without being replaced by a similar legal protection framework, it would leave innumerable state properties with a multitude of social functions defenceless against outside pressure. Similarly, given the evident lack of resources in the vast majority of local governments in rural areas, the Forestry Administration must not abandon its present supervision of the forests officially classified as municipal property, with the exception of the local governments which can prove that they have sufficient technical resources or those that are grouped together for the same purpose. Local governments must be given the responsibility for supervising the recreational usage of the classified forest areas. This may well become an important source of municipal income, provided that such uses are compatible with the managed harvesting and preservation of the forest ecosystems.

10.7. LAND ZONING AND MANAGEMENT

Some Autonomous Communities such as Murcia have drafted their Forestry Plans as Industrial Zoning Guidelines, placing forestry planning under the broader territorial zoning regulations, as described by the Regional Zoning and Planning Act 4/1992.

National Act 6/1998 has been questioned on constitutional grounds. It enables forest land to be rezoned for urban development unless it has received special protection under general zoning plans or legislation on protected natural areas. Certain forest areas, particularly wetlands and public utility forests, should indeed be declared *ex lege* as non-developable. The future Forest and Forest Uses Act should establish this classification explicitly, while also allowing Autonomous Communities to zone their land and define the boundaries of permanent and non-permanent forest areas for agricultural and/or forestry uses indistinctly. This would revive the function attributed by Act 4/89 to the Natural Resources Management Plans (PORN). Moreover, Autonomic forest planning may revise the legal format of the PORN, as done by the Andalusian forestry legislation. This is one of the basic items discussed in Sections 1.4 and 1.5 of the Second Part of this Strategy.



PART TWO: FOREST POLICY PROPOSALS

1. THE BASIC PRINCIPLES OF THE FORESTRY MODEL

1.1. MULTIFUNCTIONALITY AND SUSTAINABLE MANAGEMENT. ENVIRONMENTAL EVALUATION AND FOREST MANAGEMENT

The Río de Janeiro conference brought about world-wide acceptance that forests are of global importance due to their contribution to maintenance of the essential ecological processes, especially those related to regulation of the water cycle, the climatic change and preservation of biodiversity.

This importance of forest and other wooded lands does not prevent them being assigned social roles (employment, recreation, cultural, maintenance of the population in the rural areas, etc.) and economic importance (timber and secondary harvestings, supplies of raw materials, etc.). Not all forest and other wooded lands fulfil each one of their roles in the same way, but rather each one will do so depending on their natural biotic and abiotic features, on their use throughout history, on their location in relation to other spaces and on organisation of forest ownership and management traditions.

Society is increasingly aware of the role of forests in our environment. It knows that forests are not just communities limited solely to a population or set of trees, shrubberies, and grasslands in harmony and more or less intimate mixture, that provide an annual or periodic revenue from tangible or quantifiable products. They are also fundamental in regulation of the cycle of nutrients, healers of the atmosphere and an inappreciable source of ecological, genetic, landscape, cultural and recreational values. All these aspects are summed up by multiple use, a term applied to forests since the 6th World Forestry Congress (Madrid 1966) that now includes *multifunctionality* which expresses a functional balance based a priori on the fact that the functions of the forests are not exclusive. Thus, for management purposes, forests must be regarded as multiple-use systems. The Spanish Forestry Strategy does not consider hierarchical organisation of functions over small areas, although due to the multifunctional convergence in homogeneous forest areas or zones covering an extensive territory, it is possible to establish priorities, compatibilities and degrees of subordination between functions. What is required, on a lower level, is to guarantee the existence of mechanisms that may perform the multifunctionality analysis at the lowest possible specific operating level.



The application at the multifunctional national, regional or county geographic scale requires a specific instrument. The optimum approach would be for regional forestry strategies to initially determine the forest stands in which some functions - ecological or social - must prevail over the economic ones. To achieve this, strategic environmental assessment of plans and paragraphs is the ideal mechanism. To this end, the regional forestry strategies must undergo this type of environmental evaluation according to the specifications provided later in the section on structural reforms.

Application of this grading at a lower level requires certain criteria of forest systems' management according to objectives and preferential uses, that is to say, different types of action and application of specific forestry.

However, in addition to the multi-functional ones, forestry management models must assume the criteria of ecological, social and economic *sustainability*, defined as *the administration and use of forests and forest lands in such a way and intensity as to maintain their biodiversity, productivity, regeneration capacity, vitality and potential to fulfil, now and in the future, the relevant ecological, economic and social functions on a local, national and global scale, which do not damage other ecosystems*⁷⁵.

This in turn involves time and spatial planning of forestry procedures, i.e., preparing long term management plans and projects, or at least technical plans for forestry management that may be periodically reviewed. Fulfilment of the criteria of sustainability must guarantee maintenance of the other criteria.

Forest Management in the generic sense⁷⁶, is the basis of sustainable forestmanagement. The objective of this is for the forests to fully and continually fulfil their multiple role, improving, if possible, their capacities to achieve this, but in any case, Forestry Organisation is a planning process, as one must have the following available sequentially:

- ∄ Inventory with collection of data on the ecological and socio-economic factors, analysis of forest stands and of the forest infrastructures.
- ∄ Definition of the objectives and priorities among these.
- ∄ Correct evaluation of alternatives and decision making.
- ∄ Moreover, the structure of the Management Project must contain the Annual Programming and the Reviews to be performed.

⁷⁵ Resolution H1 of the II Ministers' Conference on Forest Protection, held in Helsinki in 1993

⁷⁶ Depending on the forest concerned, the Organisation may be established in a Project, a Dasocratic Plan (abbreviated Project), albeit a more complete one than a preliminary project - or in another similar object, but the ends and methodology are similar, and in all cases an annual usage plan is required.



In time, although there may be variation in the ongoing forestry objectives, the spirit of the Management has been presided by the maxim of Conservation, taken advantage of the principle of sustained persistence.

Formally, the *General Instructions for Forest Management*, approved by Ministerial Order of 29 December 1970, remain in force as the Supplementary State Law. Their content and role in present day society must be reconsidered in order to include the elements that have been defined later in new instructions, such as social sustainability, conservation of biodiversity, etc. A different way to state this is that the Management Instructions will have to be *reviewed* in order to adapt them, as much to the concepts of multi-function and sustainability stated, as well as in order to define a more simple, accessible system for smaller forests, which are usually privately owned.

Within the setting of the sustainability factors mentioned, especially that of diversity, one must not forget that the Spanish biogeographical spectrum has Macaronesian, Atlantic, Mediterranean and even Alpine features, although one may not avoid the fact that, in general, Spanish forests are essentially characterised by their Mediterranean influence, a circumstance that must be especially emphasised in the Spanish contribution to the Forestry Strategy of the European Union and in the adaptation of the resolutions by the Ministerial Conferences on Forest Protection in Europe to Mediterranean forests. Such consideration assumes that the Spanish forests, except for some of those located in the zones of Atlantic influence, are characterised by their fragility and heterogeneity, as well as by the extraordinary importance of their positive external factors, compared with the scarce profitability of their direct benefits.

1.2 PUBLIC UTILITY FORESTS

The Catalogue of Public Utility Forests is a public administrative register which includes *all forests that have been declared to be of public use, belonging to the State as well as to the local bodies and other public corporations and organisations*⁷⁷. For each forest catalogued in each province, this register includes information on its ownership and legal status, that of the municipal districts in which it is located, its borders, its area, whether it has been demarcated or setted up with boundary stones, the rural servitudes upon it and the dominant species.

The figure of the Catalogue of Public Utility Forests has protected the Spanish public forests for a century and a half, given its special constituent nature, as well as those arising from the border marking, and other features tending the consolidate the public property. It being obligatory to execute a Management Plan in them has ensured their sustainable management to date, so the current model, which has proven its validity, must not be substantially modified by this Strategy, but rather, this and the Basic Act on Forest and Forest

⁷⁷ *Forest Regulation passed by Decree 485/1982 of 22 February*



Harvesting. must just adopt their characteristics to the present structure and responsibilities of the Authorities, reinforcing it and thus consolidating the public property.

The public use of a forest belonging to a public entity is the consequence of it providing the Community functions, whether far or near, the following being the cases in which the laws in force have foreseen declaration of a Public Utility Forest⁷⁸:

- a) those standing at the heawaters of river basins;
- b) those which, in the present state or reforested, are used to efficiently regulate major changes in rain fall behaviour;
- c) those that prevent earth or rock slides and dune formation, anchor or hold down loose soil, shelter towns or crops, channels or roads, prevent soil erosion, on slopes, and cloudiness of the water supplies to towns;
- d) those that dry up swamp-land;
- e) forests whose regular harvesting ensures the permanent hygienic, economic and social conditions of the county towns;
- f) and, in general, in the case of forests and other wooded lands that, due to their location or area, which it is necessary to conserve or reforest due to their economic or physical influence on the nation or county, public health, the best water regime, security of the land, the fertility of the land assigned to agriculture, or due to their utility for national defence, when required by the Military Authority.

Some Autonomous Communities have eliminated the formal category of Public Utility Forest⁷⁹. Andalucía has included it in the new classification of public forests, and others have included other causes to declare status. The future Basic Act on Forest and Forest Harvesting will clearly have to set the criteria at basic by-law level, which is proposed later in the sections concerning the Catalogue of Public Utility Forests and the actual Basic Act.

One of the possibilities a modern forest policy provides is that of including private forests fulfilling similar functions to those required for listing in the Catalogue in this category if the forest is public. However, it would be foreign to our historical and juridical tradition and would cause a great deal of confusion. Moreover, a modern State must base its territorial policy on the need to avoid confiscation of management powers. There are more than enough mechanisms in our Constitution and the expropriation laws to acquire land the Constitution considers so externally positive as to make their transfer to the public ownership recommendable.

The problem has also been solved historically through the figure of protection forest and the policy to follow concerning these is analysed in the next section.

⁷⁸ Article 25 of the current Forest Act.'

⁷⁹ Although all the public forests in the Autonomous Community have been legally included in that category.



Finally, Public Utility Forests give rise to the historical dilemma that, as seen in the diagnosis of the situation, the great majority are municipal property, while practically all their management has been carried out by the national forestry authorities, and this has now been devolved to the Autonomous Communities in most cases. In some, such as that of the Autonomous Community of Madrid, such figures as County Boards have been created to allow municipalities and other parties concerned to participate in management of those forests, albeit only for consultation purposes.

The European Union Agenda 2000 envisages the possibility of devolution of a certain management capacity to municipalities by Autonomous Communities that wish to gain access to the structural funds provided for in the future Rural Development Regulations (see Appendix VI). In addition, in some areas of Spain such as Castilla y León and Catalonia, the municipalities no longer feel technically able to undertake the management, but rather are claiming it for greater improvement and approach to their multiple functions in what the regions see as interests. The future Basic Act must thus create flexible instruments that will allow the Autonomous Communities to create municipal or county joint responsibility procedures for forestry management, as long as the supra-local interests are duly safeguarded and proven technical capacity is available.

In fact, one must not forget to mention the importance of the common forests to many municipalities. These are public assets, which in many cases belong to supra-municipal bodies, or lesser local bodies than those foreseen in Legislative Royal Decree 781/1986 which approves the Remodelled Text of Local Regime, and in the regional laws, such as, for example, the Municipal Community Boards, the Village and Land Communities, or City and Land, non associated, Royal Estates, Universities, Grazing, Lumber and Water Communities, and other similar ones.

Their use and enjoyment is pursuant to the terms of Articles 94 and 108 of the Regulations on Local Entity Assets, foreseeing a regime of common or collective use, another specific one if the prior one is not applicable, or assignment of the operation in public auction if the above are impossible.

Indeed, Management of Public Utility Forests is no longer a principle that inspires forest policy, but rather a legal obligation.

1.3. COMMONLY OWNED NEIGHBOURHOOD FORESTS, PRIVATELY OWNED FORESTS AND ADMINISTRATIVE INTERVENTION

The process to return the ownership and management of the forests to the neighbours' associations may now be considered a praiseworthy historic process and one which has



practically concluded, after their confiscation throughout the 19th Century in the confusing ceremony of bringing democracy to management of the Local Governments and their identification with the people they govern, i.e., how the Local Government ceased to be a link in the transmission of royal power and became the Administration chosen by the people, so the governor-town council was erroneously identified with those governed-residents, as the former took over the common assets of the latter.

The failed Act of 27 July 1968 and its Regulations of 26 February 1970 were corrected in 1980 by Act 55/1980 of 11 November. Galicia, the Autonomous Community where there are the greatest number of these forests, completed the process through its Act 13/1989 of 10 October, developed by Decree 260/1992 of 4 September and article 14 of Act 4/1995 of 24 May, on Civil Law in Galicia. However, the special nature of these associations or communities, which fulfil duties of social interest through their administration of the forests - and ensure survival of its cultural identity - beyond the mere use of the common forests, requires an effort to allow them to convey their conceptual world to the technocratic national authorities. The problem, basically an issue of economic and tax regime, is dealt with in the section on structural reforms.

As to privately owned forests, one must consider that some economic and functional features that are inherent to their ownership are factors that affect the administration and management of the forests. The importance of maintaining the multiple roles played by the forests makes their ownership important to society at large. This peculiarity of forest ownership, which distinguishes it from any other territorial property, justifies and obliges the Administration to monitor the forest exploitation and safeguard the forests, especially the protective ones and those located in protected natural spaces. However, that administrative supervision may never lead to confiscation of the faculties of private property recognised by the Constitution in force, so an adequate framework must be created so private owners may contribute in a natural, multi-functional way to sustainable management of their forests, without administrative regimes that restrict their powers of management.

This Forestry Strategy thus proposes a liberalisation of privately owned forests in such a way that their owner takes the relevant decisions concerning their management, and the Authorities simply monitor them and encourage sustainable management in the context of the presentation of an organisation plan, or a technical plan for the forest, through economic support for their owners, once the organisation or technical plan is approved by the Authorities.

However, such liberalisation may not become a model that revives quasi- omnipotent Roman ownership models that leave the private individual the decision to transform forest into arable land or to freely determine what species to plant or grow, without any limits whatsoever arising from regional forest policy. The Constitution does not shelter such property rights, but rather determines that their social function shall define their content, pursuant to the laws.⁸⁰

⁸⁰ Article 33.2



Government policy, seen as the sole symbol of forest policy which is normally implemented by techniques that make even prunnings and fellings or any silviculture operation subject to authorization, is becoming excessively technocratic in some areas. The administrative discretion being used by the Forestry Services, which really substitute the management powers of the owner, has led to the desire in the sector to formalise a statute of ownership that may lead to a model that ignores the social function of such property.

If, in addition to this, one adds the fact that no compensation whatsoever is offered to the owners when the social-economic benefit to third parties, i.e., the social and environmental function of the forests, their external positive factors, are now recognised and even imposed, it is even logical to strive for a complete liberalisation.

Moreover, the failure to distinguish the unit in charge of management of the public forests, and the one in charge of safeguarding private forests, tends to generate uniformity in the organisation that is not always justifiable and, above all, a concentration of application of budget items focused on the State's own properties. Although some Autonomous Communities, such as Castilla y León, have laws that envisage general systems of premiums or subsidies for private forests, there is not usually a sufficient financial base to make these really effective, nor to compensate the positive external factors, nor to assure a minimum economic profit. The present state subsidy system, Act 19/1995 on modernisation of agricultural farmings, has not been really effective either as to the foreseen system of forestry grants.

Finally, taxation of the sector and the figures of protective forests and of obligatory consortiums have also helped to spread the idea that private forests have a quite different statute of ownership to that of agricultural, urban or industrial land, encouraging the wish for complete liberalisation.

Some formulas, however, do not reach such a complete liberalisation, which would involve departing from the model of ownership described by the Constitution, but instead allow a new private property statute to be established, in line with the faculties recognised for this in the European Union countries where private forests are liberalised, although subject to basic terms and control by the Authorities based on the technical projects and plans, as well as on reporting actions by private individuals.

The guiding principles of that statute are:

- ∄ Land zoning powers belong irrenounceably to the Autonomous Communities.
- ∄ The Autonomous Communities shall have the competency to establish limitations or conditions to transform the use of forest land or replace forest species with others.
- ∄ However, the policing competencies of the Autonomous Communities may be exercised to a greater or lesser extent. If the private owner has consulted or submitted a



management plan for approval, it is logical that unique acts of management, if they comply with the plan, cannot be reviewed discretionally by the Authorities. This may, thus chose models that are limited to controlling each specific act – felling and pruning permits - without imposing or encouraging prior planning or, on the contrary, may encourage the latter by liberalising these acts.

- ∞ The Authorities shall approve the management plans and supervise their fulfilment, and for that purpose may apply reliable, credible self-monitoring systems by the associate forest owners, such as that provided by voluntary forestry certification.
- ∞ The Autonomous Communities must opt to separate the administrative units and the budget items aimed, on one hand, at management of public forests, and, on the other, the general ones of forest policy. One must remember that when devolution to the Autonomous Communities took place, the national civil service had two different units, ICONA for public forests and the Forestry Service of the General Directorate for Vegetation Production for private forests, both then assigned to the Ministry of Agriculture, while the Autonomous Communities nowadays have a sole forestry management unit, as the pre-existing ones have been unified.
- ∞ Drafting the autonomic forest policies, especially those concerning private forests, must be subject to the principle of participation in them. The formulas may range from participation by the main associations representing the owners, consisting of hearings or statutory consultation, to creation of more institutionalised forums, or even direct participation in the collegiate administrative body that establishes the policy, with delegation, even of functions on those representative bodies, as long as there is a minimum amount of administrative supervision to prevent unconstitutional neglect of responsibilities.
- ∞ To encourage association membership by the owners to structure the sector, so the associate owner may have a greater possibility of management.
- ∞ To undertake an adequate economic incentive policy for private forests to compensate for the positive external factors of the forest. The section included among the structural reforms in this Strategy specifies what this policy may consist of.
- ∞ To carefully study the effects inclusion of a forest in the Natura 2000 network will have on the forest management.
- ∞ As stated in the previous section, when the social and ecological functions of the forest are so evident as to cause them to be declared as Public Utility Forests, the Forest Authorities must proceed to acquire it.
- ∞ The figure of protection forests must be replaced by another voluntary category that is thus conditioned by negotiation of the benefits to compensate limitation of management deemed fit by the owner.
- ∞ The institute for the forced reforestation consortium will be suppressed in private forests and an appropriate solution provided for the present Consortiums and Conventions, which have become completely outdated due to application in Spain of reforestation of



agricultural land, in the sense that conversion to more advantageous and less costly figures, and one must even consider condoning debts - or studying their financial rebalancing - with the undertaking by the owner of the land to manage the existing stands sustainably due to the positive external factors involved nowadays.

- € Overall, it must be possible to endorse this private forest property statute with those generally existing in the European Union countries, and it must be recognised as basic legislation to develop article 149.1-1 in relation to article 33, both of the Constitution.

1.4. THE INDEPENDENCE OF THE AUTONOMOUS COMMUNITIES TO DESIGN THEIR FORESTRY POLICIES AND ADMINISTRATIVE CO-ORDINATION

The model must be based on the national administration having to provide the basic forestry laws (article 149.1-23 of the Constitution) so only in very exceptional cases is management to be assigned to it. On the other hand, the model must allow, in turn, different autonomic forestry policies, as establishing the balance of functions concerning the specific territory of an Autonomous Community is due to it. Thus, this Strategy and the future Basic Act on Forest and Forest Harvesting must be based on the possibility of opting for productive forestry models, although also for landscape oriented forestry models - tourist, urban perimeter tertiary use, basically recreational functions, to combat erosion to encourage agriculture lower down the valley, or models with the basic purpose of settling the population combining the multiple functions of the forest, or giving priority to some over others. The autonomic strategies will be the generic planning documents that set the priorities and make these political options transparent. However, the Spanish Forestry Strategy must guarantee a co-ordinated policy of achieving national ecological, social and economic objectives, as well as adequate access to all the European financing sources and options.

The above- mentioned fact that the multifunctionality must not necessarily be articulated by creating a uniform management regime, so the Forestry Strategy cannot establish any generic hierarchy between the different functions of each forest, does not mean that the national Authorities and the Autonomous Communities may not reach agreements in matters in which it is necessary to work jointly in the case of some forest stands. For example, in a network of research or monitoring plots, or areas that must be submitted to hydrological-forest restoration processes, or to combat desertification, or assignment to production of forest raw materials. Apart from these exceptions, the forestry management model must be established within the framework of the autonomic strategies. Moreover, although it is the Nation that must establish the private property statute⁸¹, the basic legislation may offer gradual models, ranging from a minimum to shared administration, from full

⁸¹ *Articles 149.1,1ª and article 33 of the Constitution.*



licence to supervision techniques, which allow each Autonomous Community to undertake the reform of its forest policy without risk to the body of Spanish forests.

The issue of greater involvement by Local Authorities in preparing and managing the forest policy is discussed in Section 1.2.

Within the national Administration, one must encourage interdepartmental co-ordination instruments so there are no dysfunctions, gaps or duplication of the tasks to be performed by each department with responsibilities in forestry matters, and the resulting action arising from the synergy between all of them. For example, lands such as *dehesas*, where forest harvesting is combined with agricultural and livestock farming activities and provide major indirect ecological and social benefits, must be regulated in a co-ordinated manner, so they may take advantage of the policies that affect each one of their characteristics. Forestry research must be co-ordinated following the guidelines of the Science and Technology Office programmes, reforestation of agricultural land must be performed most precisely according to the technical data provided by the seed services to guarantee the best possible results; a European decision monitoring group must be established to make the necessary updated data available to determine the future use of the land when Community subsidies cease. It should be possible to improve the present form of combining the organisation of private and public forests, with the agricultural policies that may increase the added value of their products, along with the industrial, energy and commercial policy of other exploitations, recreational while uses and tourism should be co-ordinated with the general policy for rural tourism by the Tourism Observatory recently created as a national consultation forum.

The instruments for co-ordination with other ministries and administrations whose actions affect the forest areas must also be improved.

Indeed, regulation of joint administrative units of the forest policy between the Ministries of the Environment and Agriculture and Fishery is a requisite which may only frustrate the citizens' hopes if ignored. The very definition of the concept of a forest, for the purposes of establishing the object of the forest policy, must be articulated so it maximises both the forestry and agriculture policy in the fields liable to be simultaneously the object of both policies.

Thus, regardless of the need to articulate joint research plans and programmes for *dehesas*, coppices and other agricultural-livestock-forestry use areas, as well as for livestock tracks, providing them the political impulse that will eventually back the actions foreseen in Act 3/1995, both Ministries and the relevant autonomic councils must work jointly to prepare a single rural development programme, giving rise to an integrated rural policy; also increasing the inclusion of measures on forest products in the European Union initiative Leader II; in managing the interdependence of livestock farming and the forest areas; in the supervision of the effects agrarian extension and other agricultural programmes may have on borders and riversides; in studying what forest products may be applied the technique of establishing guarantee prices as the actual agricultural products they really are; and in



supervising the cropping policy and zoning of agricultural and forestry use, all using categories such as temporary agriculture or forest areas.

1.5. SETTING OBJECTIVES FOR PRESERVATION, MAINTENANCE, IMPROVEMENT AND REFORESTATION

The Spanish Forestry Strategy applies the policy of quantity and quality preservation of our forest stands. This principle does not prevent us from considering the need to set quantitative objectives for reforestation due to some of the industry action plans such as those to combat desert extension and erosion, and to regulate the water cycle.

Spanish participation in the Climatic Change Convention, especially after approval of the Kyoto Protocol, as well as its status as a member of the European Union, thus being subject to application of the Common Agricultural Policy, means that the area and quality of the forest stands conditions other environmental policies such as those for agriculture, industry or energy. Due to this, setting the quantitative objectives for the maintenance, decrease or increase of forest stands must be specified as a national objective through an instrument approved by the Industry Conference, that may do so at least politically, without legally binding value.

In turn, the Autonomous Communities have a sufficient margin of decision to be able to opt for different territorial forestry alternatives. One may not, however, reject national plans having a high degree of consensus concerning an additional reforestation policy, as long as sufficient budgetary credit is generated to implement these. State owned land, such as those of the Water Boards, Ministry of Defence land, etc., may also be submitted to reforestation plans is considered necessary.

To sum up, reforestation must be a priority, although this is a reflection for the Autonomous Communities, as in some regions, such as those in the south east of the peninsula, these terms may be inverted in order, for example, to combat desertification.

It is certainly not possible to reformulate the obligatory reforestation conventions or consortiums for the reasons stated concerning the private ownership statute, which are also applicable to public ownership forests.

On the other hand, the agricultural land reforestation programme, with its lack of definition as to the final status of the reforested land, is a scheme for agricultural purposes, so it may not be considered a key piece of state and autonomic reforestation, notwithstanding what has been discussed above as to the need for co-ordination to maximise the choice of



species from the scientific point of view and avoid propagation of pests or other undesirable secondary effects of the programme.

1.6. INTEGRATION OF THE FORESTRY STRATEGY INTO RURAL DEVELOPMENT

Forest land and economics, in the broad sense of the term, form part of the rural environment and economy. A modern forest policy for Spanish forests must be part of a more integrated, ample approach to the social and economic development of the rural resources, as is already happening in agricultural development.

From this point of view, forestry and agriculture are not clearly defined and the relevant policies must serve the common objective of developing the rural environment and, specifically, to provide a sustainable management of the resources that contributes to boost wealth, economic diversification and job creation.

Forestry work has strong effects on employment policies, not only due to the large amounts of labour required, but also due to the seasonal complementary nature of such work, as it usually coincides with periods of low employment in the agricultural sector.

On the other hand, there is a growing tendency to consider the physical environment of rural areas as a mixed system, where agricultural, forestry and livestock farming activities complement each other. This brings about an increase, above all in areas which are less fit for high yield, in extensive production methods in which better use of the resources is achieved through integrated management of forests, crops and livestock.

This interaction among forest stands, agricultural and livestock farming systems is one of the main principles of rural development, aimed at environmental improvement of the natural resources that is compatible with the feasibility of the model which makes population settlement possible, which is also one of the basic principles of the forest policy.

1.7. LINK BETWEEN THE RURAL POPULATION AND THE FORESTS

Forests naturally form part of the rural space. One may not conceive a forest policy without participation by the population whose lives are linked to that space. That participation is essential for the definition of the forest policy as well as its application.

The importance of that link can be seen by observing and comparing the different reactions of the population to the presence of a forest fire, or when the consuetudinary balance between livestock farming and forest harvesting is altered.



These realities, well known to those who are in contact with the forest, show the interdependence between the activities and the needs, based on the view point of the people involved, especially those who make a living from the forest, are included in the forestry management. One may not conceive a forestry sector without rural producers.

Thus, one must consider the appropriate procedures to define and encourage association membership which allows initiatives to be undertaken which would otherwise be impossible in small plot property ownership (70% of forest land is privately owned).

The different initiatives by the authorities over the last decades have given rise to and promoted different associations among the population affected by public problems or actions, leading to a rich variety of association bodies, conceived and organised according to the objectives they propose, thus forming a really effective fabric to manage their affairs. This variety ranges from Co-operative Companies, or SAT, to associations related to animal and vegetation health (ATRIAS and ADS), irrigation communities, denomination of origin regulation councils, producers' organisations, (APA and OPR), as well as the professionals from the different sectors and Local Action Groups of the LEADER Rural Development programmes, who act at the initiative of the European Union, is based on and has the corrective of active operation of these Local Action Groups, which shall also extend their initiatives to forestry measures.

This mesh of associations has permitted the vertebration of the rural context required to undertake any action, and thus when faced with the new perspectives of forestry development according to the principles of sustainability and multifunctionality, it is considered essential to articulate the rural population through bodies created specifically for that purpose.

The national Authorities, exercising their responsibility to enact the basic national laws after consulting the Autonomous Communities, must establish the Bases for recognition of the Association that acts on an estate or specific forest land.

2. THE NECESSARY STRUCTURAL REFORMS

2.1. INSTITUTIONAL FRAMEWORK: THE INDUSTRY SECTOR CONFERENCE AND THE HIGH OR NATIONAL COUNCIL



The implementation of the Forestry Strategy will encourage the definitive clarification of the constitutional distribution of the responsibilities that may be attributed to the Central Authorities, to the Autonomous Communities and Local Governments in forestry matters. The future Basic Act on Forest and Forest Harvesting must thus clearly define the responsibilities of each one of them, as well as the mechanisms for co-ordination, consolidating them through creation of the relevant Industry Conference and their relevant Commissions at the level of the Directorate-General, Committees and Working Groups, some of which are now operating informally.

As a general rule, management of the necessary instruments for correct planning of public forestry policies - statistics, inventories, information networks, catalogues, etc. - must be shared by the national and autonomic governments, while the sustainable management of the forests and the action on the forestry sector, as well as the economic sector are the responsibility of the autonomic administration.

The State shall provide administrative structures which take into account that distribution of competencies, the national body that must perform the functions and co-ordinate the initiatives expressed in the different plans and programmes, according to the purposes of the Basic Act on Forest and Forest Harvesting. It must also institutionalise permanent mechanisms for co-ordination with the Ministry of Agriculture to apply the European Union rules on rural development that are common to agricultural, livestock farming and forestry matters. The rank and organisation of these structures must be an immediate consequence of that Act and of the general by-laws applicable to the Public Authorities.

In order to apply article 105 of the Constitution to the forestry sector, it would be advisable to consider constituting a more ample body of participation in which all the sectors concerned may express themselves. That participation by all the parties concerned is the only guarantee that the multifunctionality will really be applied to forest planning and management. In addition to the Autonomous Communities, participation in this advisory body, which could be called the Forestry High Council, National Forestry Council, or a similar name, would include private owner representatives, forestry research schools and institutes, the Professional Associations of forestry engineers and technicians, biologists, geologists, etc., the forestry services companies, the paper, board and furniture and other forest products manufacturing sector, ecologists' associations, the most representative Trade Union and employers' associations founded to encourage sustainable forest management. That Council should be able to create work groups and ad-hoc committees.



2.2. LEGAL FRAMEWORK: THE BASIC ACT ON FOREST AND FOREST HARVESTING

Article 149.1.23 of the Constitution orders a Basic Act on Forest and Forest Harvesting to be drafted as the general legal framework of the forest policy, and also as a reference point for the internal laws of each Autonomous Community.

As the industrial initiatives and the instruments to plan this Strategy contain the proposed initiatives to be undertaken, the following is a non exhaustive list of the aspects that legal text should include:

DEFINE:

- ∕ The geographic and conceptual space to which the actual Act is to be applied, adequately describing the forest and other wooded lands, *dehesas*, meadows and/or other spaces to which the Act shall be fully or partially applicable, as well as the necessary flexibility in the interface between the agricultural and forest land
- ∕ The legal categories taken as the basis to structure the forestry policies.
- ∕ The juridical categories on which structuring the forest policies is to be based.

ESTABLISH:

- ∕ The statutory and management responsibilities of the different Public Authorities as described in the foregoing sections. Specifically, the Forestry Industry Conference and its delegate bodies for all the initiatives foreseen in the Strategy.
- ∕ The bodies for co-ordination between the different Authorities.
- ∕ The forums for discussion and the bodies representing the different social partners with an interest in the forest, in the different aspects described in the industry initiatives. Specifically, the future Forestry High Council, National Forestry Council, or similar, as a body for participation by all the sectors interested in preparing the basic and statutory lines of the Spanish forest policy.
- ∕ The mechanisms that allow the Local Governments to manage the Public Utility forests they own, when the appropriate technical staffing requisites are met and sufficient material and financial resources are available.
- ∕ The basic penalisation regime.

REGULATE:



- ∄ The Catalogue of Public Utility Forests, their features and legal regime, and listing and de-listing of the forests in that category.
- ∄ The private forest ownership statute and the grade options the Autonomous Communities will have in relation to it and the powers of organisation and policing the private forests.
- ∄ The forms of economic support from the National Government, in co-ordination with the Autonomous Communities, for owners of private forests in forestry initiatives aimed at their conservation and improvement and sustaining their use.
- ∄ The general setting of activities related to forest production and harvesting, according to the principles of sustainability, effectiveness and minimum management cost.
- ∄ The general framework of recreational, sporting, educational and cultural activities in the forests, in keeping with their protection and so this is compatible with their functions.
- ∄ The bases to make the industry initiatives described in this Strategy possible and effective and, in general, the bases to prepare regional forestry strategies.

PROMOTE:

- ∄ Research and inventory of forest ecosystems, enabling society to exercise its right to information on forestry matters.
- ∄ Extension of the Forest Management to all those that, without being legally required, guarantee sustainable management.
- ∄ Forest association membership to achieve territorial units that allow sustainable management using an adequate instrument.
- ∄ Extension of the forested area, above all in places where this has greater external positive factors.
- ∄ Measures to protect the forests against destructive agents, such as fires, pollution, weather changes, pests and disease, etc.
- ∄ Maximum capacity forestry equipment and services, as well as those for first processing, using sufficiently large harvesting and processing units to be able to apply the best technology available at all times, as long as this is compatible with the means.

2.3. ECONOMIC TREATMENT OF PRIVATE FORESTS

The objective is to be able to guarantee the multiple use and sustainability of privately owned forest management, as these amount to two thirds of the national forest area, through incentives and economic support. Two fundamental tools may be used to achieve this:



granting the same status as crop farmers and livestock farmers, and compensation of the positive external factors of these forests.

2.3.1. Taxation

2.3.1.1. The present fiscal approach. The personal income tax (PAYE) Reform Act

In most Spanish regions, the forest has ceased to be a complement to crop growing and stock farming activity, abandoning its traditional function as a provider of pasture and fertiliser. On the other hand, most owners, even when these properties are maintained, now perform other professional activities in the industry or service sectors.

The tax approach to forestry revenue did not offer special facilities for private owners who did not receive such income due to an accessory activity to crop growing or stock farming. For the latter, on 13 February 1998, the Finance Ministry foresaw inclusion of forestry revenue within the system of objective estimation modules for Personal Income Tax (PAYE), providing a simple solution that is fiscally favourable to them.

Due the splintered nature and circumstances of forest ownership, forest plantation investment requires a simple, adequate, stable tax application on one hand, that contributes to making the Forest Activity feasible. On the other hand, the applicable tax regime must recognise the multi-functional aspect and, moreover, the positive external factors forests provide which benefit society.

Any financial analysis of forestry investments, applied with the usual criteria to companies that undertake high risks, arising in this case from the prolonged production processes, shows their low, non-existent or negative profitability. The only explanation for persistence in private forest cultivation lies in the lack of other options for the land and the owner's under-valuation of his own time, a luxury many may allow themselves due to the small size of their operation. This all leads to careless, minimum investment forest growing.

The Income Tax Reform Act⁸² has largely provided a solution to these problems as, due to enactment formalities of that Act in the Senate coinciding with discussion of this Forestry Strategy, work groups were formed at the specific request of the Finance Ministry which, along with the Fiscal Studies Institute, provided a solution to the problems considered in its drafts. However, in order to understand the reform, a short look at the background is required.

⁸² Act 40/1998 of 9th December on Personal Income Tax and other tax regulations



2.3.1.1.1. Privately owned forests

The Spanish tax system is comprised of taxes, duties and special rates. Leaving aside the latter two figures, which are taxes related to services rendered or performance of activities that especially benefit a specific subject, the current taxes are levied by three different governmental levels: state, regional and local. In addition to the above, one must mention the special territorial regimes, recognised by additional provision one of the Constitution, which are the Economic Agreement with the Basque Country and the Agreement with the Regional Government of Navarra.

Among the taxes in force in the field regulated by Common Tax Law, private forest ownership is relevant as to Personal Income Tax, Company Tax, Property Taxes, Inheritance and Donation Tax, Conveyance Tax and Stamp Duty (all of these State taxes), Property and Economic Activity Tax (local taxes). Of those mentioned, only Personal Income Tax and Company Tax in the special circumstances of revenue obtained from forestry require one to consider the possibility of granting a specific treatment, or of establishing certain scales that distinguish yields subject to the general regimes.

Personal Income Tax is a direct, personal, subjective tax on the yield obtained by individuals. In order to determine the taxable base, that is, to determine the amount of revenue, two methods are established: direct estimation, in the ordinary and simplified modes, and objective estimation.

Direct estimation

Direct estimation of the net revenue from economic activities is determined by the difference between revenue and expenses. In the simplified mode, applicable to individuals whose volume of operations is under 100 million pesetas, expenses that are difficult to justify and provisions are quantified at 5 per cent of the net yield.

With respect to Forest Activities, in this method of direct estimation, one must emphasise the provisions of article 30 of Act 40/1998, by virtue of which the net revenue generated in a period over two years will be reduced by 30 per cent. In addition, these shall not be integrated in the taxable base, pursuant to additional provision twenty two of Art 13/1996, of 30 December, on Administrative Tax Measures and those of a Social Nature, *subsidies granted to those who operate estates managed according to the technical plans for forest management, forest working schemes or reforestation plans approved by the competent forestry authorities, as long as the average period of production is equivalent to or greater than twenty years*; nor, pursuant to the aforementioned additional provision twenty three of Act 40/1998, enacted as of 1 January 1999, *subsidies granted to those who operate estates managed according to the technical plans for forestry management, forest organisation, dasocratic plans or reforestation plans approved by the competent forestry authorities, as long as the average period of production, according to the species concerned, determined in*



each instance by the competent forestry authorities, is equivalent to or greater than twenty years.

These principles require there to be a specific treatment for forestry revenue, in which subsidies received by the holders of operations that comply with the requisites set, whether Regional within the State, or by the European Community, are not included in the taxable base, and which apply a 30 per cent reduction to the net amount, as long as the revenue must be understood to be generated within a term exceeding two years.

Objective estimation

As to objective estimation, one must point out that this forms a system to calculate net revenue which is indicative in nature and allows the taxpayers who voluntarily choose this to be waived fulfilment of many of the accounting and registry obligations of the tax, calculating their net yield according to certain signs, indexes or modules that are applicable to their sector of activity.

Up to date, forest harvestings have only been able to opt for such a taxable base calculation system when performing accessory exploitations to an agricultural farming under same. The aforementioned additional provision nineteen of Act 40/1998 foresees that the Government may develop a regime of objective estimation to determine the net yield of forest harvestings that fulfil the requisites established for the subsidies to be considered exempt. This means of objective estimation is no longer in force, as studies are now being carried out to allow definition of the signs, indexes or modules on the basis of which the net yield of forest harvestings.

2.3.1.1.2. Commonly Managed Neighbourhood Forests

Commonly Managed Neighbourhood Forests form a special type of property. Their distinguishing feature is that they are owned by the residents of an area, without assignment of quotas, who operate them according to consuetudinary rules and customs.

This special form of ownership in which the forest has no juridical status and its owners vary according to whether they actually live in the area, has made it convenient to establish a new taxation regime that better suits the reality of neighbourhood forests; enacted through certain amendments to the Company Tax Act enforced through the Act on Tax, Administrative and Social Measures for 1999.

Its article 7 establishes that commonly managed neighbourhood forests own tax payers subject to Company Tax, their tax regime being regulated in the new chapter XVI of Title VIII of the Act, which establishes as follows:



1. *The taxable base for the communities own commonly managed forests shall be reduced by the amount of the profit during the financial year assigned to:*

a) Investment in conservation, improvement, protection, access and services aimed at the social use for which the forest is intended.

b) Financing infrastructure and public services works, of social interest.

Application of the profit to the said ends must be performed during the actual tax period, or in the following three ones. If the investment is not made within the period stated, the part of the full quota upon the profit not actually applied to the investments described, along with the delay interest, shall be deposited along with the relevant quota for the tax period in which said term expired.

The Tax Authorities, when checking assignment of the investments stated, may request the reports required by the competent regional and local Authorities.

2. *Communities owning commonly managed neighbourhood forests shall be taxed at the rate foreseen in section 2 of article 26 of this Act.*

3. *Communities owning commonly managed neighbourhood forests shall now be obliged to present tax returns for this Tax in the tax periods in which no revenue subject to same is obtained, nor any expense incurred, nor the investment stated in section one made.*

4. *The joint owners or members of the communities that own commonly managed neighbourhood forests shall add the amounts effectively distributed by the community to their personal income tax returns. Such revenue shall be processed in the manner foreseen for shares in company profit under section 1 of article 23 of Act 40/1998, of 9 December, on Personal Income Tax and other Tax Regulations, and they shall be applied the relevant percentages for the bodies under article 26.2 of this Act.*

The specifications covered by the principle transcribed are basically as follows. Two deductible expenses inherent to these bodies are established: investment in improvement, conservation, protection, access and services aimed at the social use to which the forest is put and the expenses of financing infrastructure works or public services of social interest. The taxation rate will be 25 per cent, instead of the general rate of 35 per cent. The obligation to present returns is waived in years in which no revenue is obtained and there is no expenditure or investment. The profit distributed among the members - even when there is no share held in the capital of the forest, as this is, as already mentioned, jointly owned without assignment of shares -, shall have the status of dividends for their receivers, who shall be entitled to dividend double taxation deduction.

These measures recognise the recognition of the unique nature and function of neighbourhood forests, which is translated into the following aspects in the scope of taxation:

1. Recognition of the social function of neighbourhood forests by allowing them to deduct the amounts effectively invested in works to finance infrastructures and works of a social nature.
2. Simplification of the management, as each one of the owners not required to pay taxes. Moreover, they shall not be obliged to make company tax returns



when there are no deductible revenues, expenditure or investment during the financial year.

3. Reduction of the taxation through application of a reduced rate of 25 per cent.
4. Limitation, in practice, of taxation of the amounts distributed among the common owners, although applying the deduction for double taxation of dividends.

This will encourage integration of this sector under fiscal coverage in a reasonable way, through fulfilment of minimum formal requisites that shall mainly provide the benefit of transparency and improved management of the actual bodies.

2.3.1.2. Action proposals

Once the main forest-related fiscal aspects have been reformed, the following initiatives would have to be studied and undertaken, if necessary:

- € Regulation of the objective estimation system foreseen in additional Provision fourteen of Act 40/1998 for forest exploitations, which is in the phase of preparation.
- € Promotion of specialised teamwork to collaborate with the Authorities and, especially, with the Finance Ministry to study all such problems and the different proposals, in order to reach an agreement on possible new initiatives related to forestry taxation.
- € An effort must be made in planning and regulation of the sector through the preparation of Management Plans or similar by the owners, in order to guarantee a real link between the social interest and the ownership, so private forests subject to Management Plans approved by the competent Forestry Authorities make take advantage of such incentives in the Personal Income Tax Act.
- € Special facilities must be provided for forest management associations in order to encourage the management of small sized forests, which traditionally fall outside the world of forestry planning.
- € Application, following justification in a technical report, of the maximum financial and fiscal aid to restore burnt-out forests or catastrophic damage caused by major flash floods from torrential rain, as well as for investments in fire prevention measures.
- € Application of the Proposal to the Parliament concerning application of the reduced rate of VAT to firewood.

2.3.2. Subsidies



Within the framework of the European EAGGF programmes, the Directorate-General for Nature Conservation and the Autonomous Communities have designed a subsidies programme for the private sector aimed at improving the plant cover. The distribution of the total amount assigned to this purpose is performed by the Industry Conference, as indicated in Article 156 of the General Budget Act.

Some Autonomous Communities also foresee a full juridical regime of premiums and grants, as in the case of Castilla y León.

Maintaining or increasing such aid is deemed to be of enormous importance to the private sector which covers two thirds of the forest area of Spain. The Forestry Strategy must consider the need to maintain or review the criteria used for distribution by the Autonomous Communities, in order to adapt them to the objectives stated in it, for which the relevant agreement by the Industry Conference is required, especially when European renegotiation of the Rural Development Regulations seems to be aimed at increasing the budget assignment to these programmes.

Moreover, in line with the formulation of the forestry model, owner associations may be encouraged to rationalise small sized plots of forest land to form the minimum territorial units liable to organisation. The Strategy proposes assigning funds from the section of subsidies to that purpose, which must modify the territorialisation of the budget credit for a new line of action within the Industry Conference.

As additional support for privately owned forests in which the social, protection or ecological factors cause limitations in their economic feasibility, and are also in the public interest, the new Rural Development Regulations of the European Union foresee a post-year 2000 application of economic compensation for their owners in order to maintain assets considered to be in the public interest.

Indeed, the tax deduction of all subsidies provided by the new Personal Income Tax Act described in the preceding section will be a clear incentive for such a practice of premiums, as their real value - and not just the net figure - may be fully assigned to forestry management or investment.

2.3.3. Fees, agreements and other instruments to finance positive external factors

The positive external factors of multi-functionality, that is to say, the benefit of protection, ecology, social and structural correction arising from a specific type of management, are not generally a benefit to the owner or manager of the forest where investment takes place. Present accounting systems do not allow the owner retribution for the benefit society receives from such management. As the economic benefit is generated by the owner of the forest at the cost or risking capital, with the additional risk which means a fire, pests or disease, a risk it is necessary to quantify, the Basic Act on Forest and Forest



Harvesting should ideally consider the possibility of creating fees, rates or other similar instruments that may cover the expenses arising from these services offered by the owners of forest properties.

The future Act should provide juridical coverage for conventions or contractual forms between the Authorities and individuals so they provide incentives for uses that are more in keeping with the State environmental or social policies, as well as safeguard biodiversity, the landscape, natural heritage or encourage forestry production and rural development. This legal coverage must not only be aimed at the juridical security as to its validity to the Regional and Local Governments, but should also be used as a possible criteria for assignment of any public funds to fulfilment of their ends.

Total suppression of parafiscal measures within the state is an irrenounceable policy: the principle of joint treasury imposed by the state rates and public judgement laws was a national priority due to the traditional abuse of the system to finance the most absurd parapublic undertakings. It is therefore unthinkable in the medium term to consider a state fiscal reform that would allow such parafiscal measures. However, there is nothing to prevent them from being carried out by the Autonomous Communities that have not yet done so, as otherwise, as sole managers in the field of forest policy, they are able to appreciate the effects of the parafiscal measures (fees for hunting licences assigned solely to hunting practice, fees for recreation in the public or private forests, rate for use of forest paths or roads, etc., ultimately aimed at improving forestry management). Moreover, their experience may well provide an excellent laboratory for more ample later experiments to be applied nation-wide.

2.4. ENVIRONMENTAL IMPACT ASSESSMENT

Forest stands have evolved positively in recent years according to the data now provided by the Forest inventory. Environmental research has increased dramatically and now Spanish authorities definitely have much better knowledge of how the ecosystems work, the interrelations between living beings and their habitats and, thus, they may perform better analysis of the activities leading to implementation of first reforestations on land prepared for that purpose.

First reforestation is work which Spanish law now requires to be subjected an Environmental Impact Assessment when it may have a significantly negative effect on the environment. Appendix 2 of Royal Decree 1131/1998 of 30 September, which approves the Regulations for execution of Legislative Royal Decree 1302/1986 of 28 June, on Environmental Impact Assessment, presents the specifications related to environmental assessment of such reforestation. Point 11 of this Appendix 2 specifies that these are *first reforestations, when they involve the require of severe negative ecological transformations*.



First reforestations are understood to be all plantations or sowing of forest species on land that has not had a major tree cover in the last fifty years of trees of the same species as those to be grown, and all those intended to be established on land that has been bare of trees in the last ten years.

There is a threat of severe negative ecological transformation when one of the circumstances described in the said Appendix arises, including partial destruction or elimination of items of protected species, or those in danger of extinction, destruction or negative alteration of unique botanical, fauna, soil, historical, geographic, literary, archaeological, landscape and other such assets, or the use of species not included in the scales of natural succession of the relevant vegetation in the zone to be reforested.

Additional Provision Two of Act 4/1989 of 27 March, on Conservation of Natural Spaces and Wild Flora and Fauna, increased the list of activities subject to Environmental Impact Assessment by including transformation of land use that involves the elimination of the scrub or tree vegetation cover and the potential risk to infrastructure of general interest to the Nation and, in all cases, when such transformations affect areas exceeding one hundred hectares.

This legislation is undergoing further expansion with the inclusion of a recent European Union Directive⁸³ which obliges the Member States to transfer to their national laws the enactment of mandatory Environmental Impact Assessment of initial reforestation and clear cuttings aimed at changing land use.

Moreover, the draft Directive on Strategic Environmental Evaluation⁸⁴ shall shortly be enacted. Approved by the European Commission in 1996, it establishes the convenience of its application to plans and programmes.

The future Environmental Impact Assessment Act should thus be the ideal framework to reform whatever is necessary in relation to environmental impact assessment in the forestry sector.

In many cases, the autonomic laws have already gone beyond the minimum set in the state laws in force. The Balearic and Canary Islands and other Autonomous Communities have made opening up of forest tracks or reforestation of areas exceeding one hectare subject to simplified evaluation or similar procedures.

Overall, it thus seems recommendable for the new Environmental Impact Assessment Act to apply this procedure to the activities in Appendix II of Directive 85/337/CE, first draft, especially when the activities take place in a zone included in the Natura 2000 Network. Likewise, in fulfilment of the Habitats Directive 43/92/CE, it seems convenient for the remaining Forest Activities to be submitted to evaluation of their repercussions when these

⁸³ Directive (CE) 97/11 of the Council, of 3 March 1997

⁸⁴ Proposal of Directive 97/C 129/08 concerning assessment of the effects of certain plans and programmes on the environment (DOCE 129/14 of 25th April 1997).



may have a significant effect on one of such zones. It is also convenient for there to be an evaluation or study of the environmental impact of the activities listed by the Natural Resources Organisation Plans pursuant to Act 4/89 of 27 March, and the orientation criteria and plans to recover species in danger of extinction.

However, one must further consider that the strategic evaluation of plans and programmes may be the most ideal tool to guarantee multifunctionality and sustainable management at a regional level. If the regional strategies fulfil their purpose, they will determine in which forest areas certain ecological, social or economic functions or others must prevail. It would be most convenient to submit them to strategic assessment to achieve this. One must bear in mind that if such regional strategies and plans are submitted to this process, their subsequent organisation and management will be much easier.

As to biological materials obtained by genetic engineering being introduced in the financial field of forestry, all cases must be submitted to Environmental Impact Assessment, given the high risk of propagation if the appropriate precautions are not taken. However, the Biosecurity Protocol, now being negotiated, should provide the keys to regulate this matter.

Finally, although the reflection concerning the need to restrict or regulate clear cuttings to a specific time must be left to the Autonomous Communities, the potential impact on the natural resources make it advisable for this felling to undergo an Environmental Impact Study, as well as its restriction in Public Utility Forests in the future Basic Forest Act. It would in principle be recommendable for such felling to only be carried out from time to time, once the Impact Study is performed to assess all the ecological, economic, social and landscape assets considered necessary for the protection and/or improvement of the ecosystems, due to phytosanitary reasons, in the case of areas damaged by natural causes, when it is necessary to build infrastructure or perform duly authorised extraction activities, or if required for fire breaks or security strips.

It does not seem necessary for the construction of forest tracks, the use of specific machinery or application of certain specific silviculture beyond the aforementioned to be subject to basic legislation. However, there is nothing prevent the Autonomous Communities, which are much nearer to the territorial reality, to consider, as some already have, including these cases among those subject to Environmental Impact Assessment or environmental study. What does seem recommendable is to encourage publication of impact evaluation guides for the cases in which these are made obligatory, following the criteria of sustainability on which this Strategy is based.

3. THE INSTRUMENTS AVAILABLE TO THE PLANNING SERVICE AND INDUSTRY



Forestry planning will be the basic item used by the Autonomous Communities to rationalise their action and assure the multifunctionality and sustainable management of their forests, notwithstanding exceptional agreement on quantitative objectives for conservation, maintenance and forestry reforestation at state level according to the guidelines in section 1.5 concerning the basic principles of the Spanish forestry model.

To achieve this, the Autonomous Communities may prepare explanatory and descriptive documents equivalent to regional forestry strategies or plans which, like plans of action, will explain to the citizen, in a single document, the coherence of the overall set of its initiatives in forestry matters, some of which will be fully binding - thus included in by-laws - others for orientation - investments and foreseeable subsidies - and the rest of political undertaking. Pre-zoning to safeguard some forest stands essentially for an specific ecological or social purpose, would become part of these strategies, notwithstanding their later county application. The document must state the political lines to be followed in matters of supervision and control of the private forest management activities, the possibilities of integrating the municipalities in management of Public Utility Forests and their ownership, and the time and spatial schedule to manage such forests.

These documents should also express the way in which the forestry planning programmes embody the orders and directives obtained from the different forestry strategies at a higher territorial level, as well as the Natural Resources Management Plans and the Management Plans for the NATURA 2000 zones, if any.

The need to adapt the present instructions on forest management to their recognised public and private function: conservation of biodiversity, regulation of run-off, erosion control, direct production, non-consumption use, etc., matters which must be shown in the Basic Forest Act, notwithstanding each regional strategic document attempting to express it.

Valid financial instruments must also be established to provide incentives for forest planning, in public as well as private forests, and other types of instruments to incentivate planning and condition grants, to obtain a management project, application of a special fiscal policy solely for forests with a management project that guarantees fulfilment of their public function, etc.

Finally, the need to establish a permanent forum for work, discussion and comparison between the authorities and social interests affected, concerning forestry scale planning.

Regional forestry planning by approval of strategies conceived in this manner may become the key to transparent forestry management.

The role of the national government authorities should thus be to co-ordinate this planning, without any management functions except those strictly required - basic matters for constitutional purposes -, to support the regional forestry policies so that these may achieve maximum functionality, within their variety, and to ensure that all of them may be included within a coherent, suitable framework in the European and international forest policy.



The fact that the planning instruments should be compatible to achieve this functionality and the fact that there would be no sense in duplicating investment efforts to obtain the necessary information for all the Autonomous Communities, makes it necessary to provide exceptional planning instruments managed by the State with support by the Autonomous Communities, to be used by these.

Likewise, priority setting among the initiatives aimed at safeguarding the ecological, social and economic functions of the forests must allow the State and Autonomous Communities to unify their industry initiatives with intervention by the former when the sheer numbers of initiatives lead to economic or conceptual breakdowns that impede the existence of common minimum factors in forest policy.

In order to correctly adopt institutional plans, measures or initiatives, it will be necessary to also rely on other more specific instruments such as the Natural Resources Management Plans with general planning instruments for the nation co-ordinated by the State Forestry Authorities, such as:

- ∕ The National Forest inventory and other inventories
- ∕ The Forest map
- ∕ The National Forest statistics
- ∕ The Nature Data Base
- ∕ The Catalogue of Public Utility Forests

All the information obtained from these planning instruments, as well as that obtained from the works that structure the industry action, should be easily available to the parties administered, in traditional formats as well as new ones such as the Internet.

In order to modernise forest management, it is also necessary to undertake a series of industry initiatives in co-ordination with the Autonomous Communities, such as:

- ∕ The forest damage monitoring networks.
- ∕ The network of basic materials to improve forestry genetics and conserve the forestry genetic resources.
- ∕ Network for Unique Forests Preservation



- ∅ Ecological Monitoring Network for Forests in their Natural State
- ∅ Network of Ecologically Fragile Enclaves
- ∅ Network for Sustainable Management of Forests
- ∅ Forest fire prevention
- ∅ Pest and disease prevention
- ∅ Protection against the consequences of climatic change
- ∅ Hydrological-forestry restoration
- ∅ Combating desertification
- ∅ Promotion of the forestry sector and sustainable management
- ∅ Environmental Education
- ∅ Promotion of forestry research

3.1. PLANNING INSTRUMENTS

3.1.1. The National Forest Inventory and other inventories

All rational action on a specific natural environment requires the most complete possible prior knowledge of its structure and operation. A set of objectives has been established as the basis to develop an instrument to obtain that knowledge, which may be summarised in the following points:

- ∅ To provide updated, ongoing information on Spanish forests that satisfies the demand for statistics within the country and the European Union.
- ∅ To set up a data base which is easy to access and use for planning and management of the forestry resources in an ample sense, and of the ecosystems in which they are located, on a provincial, regional and national scale, that is accessible to any research institute, association or citizen.
- ∅ To establish an information transferral system that allows simple, periodic access and regulation of the technicians in charge of management of the planning instruments foreseen.

Implementation of the project would be based on the following regulations

- ∅ Spanish Constitution, Article 149, section 1, matter 31



- ∞ Royal Decrees establishing the basic statistics plans for national purposes
- ∞ Act 38/1995 of 12 December, on the right to access to information at the Ministry of Environment
- ∞ Regulation (EEC) 1615/89 by the Council of 29 May, which creates the European Forestry Information and Communication System (EFICS)
- ∞ Agreements between the Ministry of Environment and the Autonomous Communities

3.1.1.1. National Forest Inventory

The first national forest inventory, IFN1, designed in the mid sixties, had the almost exclusive aim of evaluating the timber yielding potential of Spanish forests, which was globally unknown up till then. The second, IFN2, prepared in the mid eighties, although also aimed at timber as the main asset to research, added a series of ecological, forestry and phytosanitary parameters that supplemented the study. A third cycle of the national forest inventory has begun which, at a rate of five provinces per annum, is expected to be completed throughout the whole of Spain at the end of the year 2007.

This third cycle, IFN3, planned in the mid nineties, is already considered one of the important international events that have taken place in the forestry and environmental field in recent years, in addition to the Act on Conservation of Natural Spaces and Wild Flora and Fauna, and the numerous forestry plans and regulations to protect nature enacted by the Autonomous Communities, which have added novelties and diversity to the existing ones, and whose mandates and recommendations the forestry managers must provide preferential attention.

Such considerations have led to the new cycle of the National Forest inventory being planned as an inventory of the forest systems. It will include at the same status at least the indicators of the productive, protective, ecological and recreational functions the forests feature in which the human being is yet another element, albeit a main one.

Thus, the IFN3 shall study not only the structure of the forest systems, as performed in a simplified manner in the first two cycles, but also those without tree cover, and shall evaluate the parameters of functioning, stability, fragility, health, vulnerability to fire, infrastructures, forest growing, ownership, protection, management, etc., ending with an estimate of their value as assets and in their ability to create stable employment. It will be based on the new technologies embodied in digital cartography, biological models, nature data bases, etc., instruments that must focus on analysis of the problems with the fundamental idea of the Inventory providing the necessary information for integral forestry system planning.



This information will be distributed in four subsystems. The first, the natural- physical system, determines and studies the most significant parameters of the biotope and the biocenosis, excluding the human being. The remaining three subsystems, the economic-social, institutional and legal, and that of infrastructures to serve the forest, include man through his action as a further element of nature. Silviculture, harvestings, social use, socio-economic, equipment, management and other facts shall be analysed and quantified, thus obtaining a deep global understanding from the four subsystems of the structure and operation of the forest nature, to adequately satisfy the demands of society in the ecological, protective, landscape, productive and social aspects.

In order to be able to achieve these objectives, performance of the inventory must be consolidated as a state competence, in co-ordinated execution with the Autonomous Communities, to carry it out not only within the field of forestry, but also within its supplementary areas, that is to say landscape, biodiversity, management, infrastructures, sustainable development, etc. In order to achieve this, there must be resources and the ability to perform initiatives that consist of:

- ∕ Obtaining updated photographs and satellite images
- ∕ Performing new photographic flights in the appropriate areas
- ∕ Field data collection work
- ∕ Updating the forestry cartography by items
- ∕ Co-ordination with the biodiversity cartography
- ∕ Study of the forest landscape
- ∕ The logical support for the Inventory data process, in its facet of comparison as well as that of new information
- ∕ Data processing
- ∕ Publication of results
- ∕ Surveys on infrastructures to serve the forests
- ∕ Research into the legal figures of ownership and protection

3.1.1.2. Other inventories

The National Forest inventory has been drawn up in collaboration with the Autonomous Communities, which are the beneficiaries at first instance of the information they contain.



Catalonia has also set up an Ecological and Forest inventory which consists of an extensive data base containing information on the main ecological and forestry parameters of the forests. It may be immediately applied through the SIBosC⁸⁵, which allows specialised consultation on the vegetation cover, species, distribution by diameter classes, growing stock, production, etc., on a specific estate, and provides the CREAM⁸⁶ the possibility of preparing reports to suit the needs of each project.

The information this inventory contains is for a different purpose to that in the National Forest inventory, both data bases being complementary, and in fact the system has been exported to other Autonomous Communities, due to this inventory being user-accessible. Such exportability should be encouraged if those Regions find it useful for their management.

3.1.2. The forest map

The Forest map is a data base that is published graphically to a scale of 1:200,000 containing data of the administrative status, relief, geology, the land, climate, hydrography, the geographic divisions, the human actions on the environment, the flora, the types of forestry management that arise in each case.

In 1986, work began on the 1:200,000 scale Forest map of Spain under the Direction of the Senior Technical School of Forestry Engineering⁸⁷, which renewed the 1:400,000 scale first edition to made in 1966, coinciding with the 6th World-wide Forestry Congress held in Spain, which was structured in three phases:

- € Preparation of the information (completed in 1997)
- € Preparation of the cartographic bases (completed in 1999)
- € Edition of the General Memorandum and the 92 Sheets of the Map with their relevant Memorandum (completion foreseen in the year 2000)

It would be advisable to continue to develop the following as continuation projects to the 1:200,000 Forest map of Spain:

- € National volume of the 1:1,000,000 scale Forest map of Spain with its relevant Memorandum

⁸⁵ *Forests of Catalonia information system*

⁸⁶ *Centre for Ecological Research and Forest Applications. It is assigned to the Autonomous University of Barcelona*

⁸⁷ *Tertiary Technical School of Forestry Engineering at the Polytechnical University of Madrid.*



- € 1:50,000 scale Forest map of Spain (digitized) on the basis of the data used for it published at 1:200,000 and its inclusion in the Updated 1:50,000 Nature Data Base of the Forest map of Spain (digitized), on the basis of the previous one, using remote detection and photointerpretation techniques (begun this year and foreseen to be prepared over a 10 year period)
- € Application of the forestry cartography produced by this latter project for the work of the third National Forest inventory, as the necessary thematic base to determine areas and strata formation
- € Harmonisation of the forest map with the cartography of natural habitats, the review of which is being planned.

3.1.3. Forest statistics

Forest statistics, that is to say, the availability of centralised data on all the factors that affect Spanish forests is absolutely necessary to provide information to any user requesting it, pursuant to Act 38/1995 of 12 December, on the right of access to information on environmental matters, although it is also essential as a means of planning and control, and to fulfil Spain's international commitments.

The main international undertakings related to statistics are those arising from application of the (EEC) Regulation no. 1615/89 by the Council, of 29 May, to create a Forestry Information and Communication System (EFICS). This regulation adopted due to establishment of the Forest Action Programme implemented a system that has become a key instrument for optimum application of the measures in the scope of community scale forest policy.

The object of the system is to compile, co-ordinate, systematise, process and distribute data on the forestry sector and its evolution, in order to obtain objective, reliable, pertinent information on the structure and operation of the forestry sector of the European Union.

In order to achieve all these objectives, it will be necessary to carry out the following initiatives:

- € Creation, maintenance and provision of the centralised forestry data base with all the forestry figures of interest.
- € Studies to establish a nomenclature of the forestry resources and ownership.
- € Study for new data base input, such as geographic referencing, maps, results of specific analyses, etc.



- ∄ Specific statistical studies, such as, for example, data on the timber trade and industrial products, and specific analyses of the needs of the different sectors.

A mechanism must be established in co-ordination with the Ministry of Agriculture, Fishery and Food to regulate the flow of data from the Autonomous Communitys and the processing sectors in order for the Ministry of Environment to obtain centralised statistical information, to process this and make it available to the Autonomous Communities and any user, establishing automatic two way communication mechanisms for this information. There is, however, for reasons beyond the objective of this Strategy, the opinion that management and production of forest statistics is not satisfactory, so this action shall clearly require an especially energetic political-administrative effort.

3.1.4. Nature Database

The first step to create a natural resources data base was taken by the Authorities in 1983, when they commissioned a study which was taken as the basis for acquisition in 1986 of a Geographic Information System (GIS) for forest inventory and management. The system, which was initially intended to set up and develop a data base called SINFONA (National Forestry Information System), gradually evolved as the years went by through development of multiple applications and with the extension and renewal of the computer equipment, until becoming the present Nature Data Base which covers practically all the areas of activity within the responsibility of the Directorate General for Nature Conservation.

Royal Decree 1894/1996, of 2 August, on the basic Ministry of Environment structure, includes preparation and updating of the Nature Data Base among the functions undertaken by the Directorate-General for Nature Conservation. The functions of the data base are structured in three groups of activities: information input, analysis and data preparation, and dissemination of information.

- ∄ Information input implies inclusion of geo-referenced cartographic and alphanumerical data on the natural media in the data base, generated by the actual Organisation or by third parties.
- ∄ Data analysis and preparation includes, among others, the tasks of topological correction, organisation of coverage, storing information and its recovery.
- ∄ Dissemination of information includes the activities of producing outputs and alphanumerical data in different formats and media in keeping with the demands received.

The main products available, or at the preparation stage in the Nature Data Base are:

- National Forest inventory
- Forestry Ownership Regime
- Protected Natural Spaces



- Forest map of Spain
- Cartography of Spanish Habitats (Directive 92/43 EEC)
- Forestry Productivity Potential Map
- Erosion Status Map
- Forest Fires
- Major Royal Livestock tracks
- Bird Banding Office
- Game Trophy Endorsement Board
- Distribution of Big Game Species
- Forestry Genetic Material
- Allué Phytoclimatic Map of
- Vegetation Series Map

The major volume of information stored and the continuous process of updating it, make the Nature Data Base a most useful instrument to develop numerous activities such as planning the forestry management, execution of studies and projects, evaluation of forest fire and flood damage, etc., to analyse assignment of projects to sensitive zones, or management of protected natural spaces.

3.1.5. The Catalogue of Public Utility Forests

3.1.5.1. The Catalogue's Protective role

The Catalogue of Public Utility Forests, a technical-juridical instrument for the defence of the forestry heritage, has traditionally enjoyed well-deserved recognition among professionally involved civil servants and lawyers.

The General Classification of Public Forests, made, approved and published in 1859, to fulfil the provisions of the General Deamortisement Act of 1 May 1855, contains the first inventory that gathers information on all the publicly owned forestry assets in Spain, the immediate antecedent to the first Catalogue of Public Utility Forests⁸⁸, which was later reviewed and led to the Catalogue of Forests and other wooded lands excepted from deamortisement for reasons of Public Utility⁸⁹, the validity of which has been maintained since then notwithstanding the amendments later made⁹⁰.

Declaration of Public Utility and inclusion in the Catalogue is probably the highest protection classification for Spanish public forests. As it is a very important figure of protection for Spanish forests, revitalisation of the Catalogue must be one of the aspects to be taken into account by all the Authorities when preparing forest policy, notwithstanding it being necessary to adapt the Catalogue to any other juridical categories of forest

⁸⁸ *Royal Decree de 22 January de 1862*

⁸⁹ *Royal Decree of 1 February 1901*

⁹⁰ *Ministerial Order of 1931, de 1942 and 1966*



classification and protection provided in the basic substantive legislation described in the national forest pattern.

The judgement by the Constitutional Tribunal on 29 July 1983 reserves the right for the State to establish the by-laws to co-ordinate preparation of the Catalogue by the Autonomous Communities, which must duly inform the State about their data, as well as about the regulations to which such preparation must be adapted, or any others considered basic, implemented for the said purposes of co-ordination. Such co-ordination is now completely necessary as, when devolution took place, only twenty-six provinces had updated data, based on the update implemented as of the Ministerial Order of 31 May 1966. The basic information available to the rest dates from 1901.

When the relevant Royal Decrees on Transfers were enacted, there were some acquisitions pending or just performed. Due to this, many of the forests transferred had not yet been registered or declared as Public Utility Forests. Even while these were forests that had belonged to the State for some time, for diverse reasons they had not been declared as being Public nor had been included in the Catalogue. Many of the forests being acquired or recently acquired at the time of drafting and enacting the Royal Decrees of Transfers to the relevant Autonomous Communities remained State property although in fact, in most cases they have been managed by the relevant Regional Authorities and still have not undergone the formalities to declare and include them among those of Public Utility. There are even some that have not been registered as State owned at the Land Registry. In any case, the process of State Public Utility forest transferral to the Autonomous Communities should be expedited.

3.1.5.2. Defence of Public Utility Forest ownership

The extensive regulation of registration and party line setting for ownership and other security interests that are so profusely regulated in the Act of 1957 and the Regulations of 1962 seem to have worked correctly so the most appropriate thing seems to be to maintain these fully in force, with slight improvements. Perhaps the only exception is the listing and delisting procedure established in some Autonomous Communities, which in some cases does not maintain the same guarantees as the laws mentioned. It is thus recommendable to attribute that power in the Basic Act on Forests and Forest Harvesting to the supreme executive body of the Autonomous Community, to fully guarantee master of the system of Public Utility Forests.

3.1.5.2.1. Inscription at the Land Registry

As inscription at the Land Registry involves presumption of ownership and possession, while inclusion in the Catalogue only grants presumed possession, without prejudging matters of ownership, due to the protection the juridical instance provides the registry institution, the prevalence that is granted in general terms to the Catalogue over



possession-related facts contrary to it fails when these are due to good faith or if the legitimisation arises from the Registry, as such matters lack the express legislative exception required for solid virtually and efficiency granted to the registration rights in order to secure property transactions.

It would be convenient for the future Basic Act on Forests and Forest Harvesting to consider that circumstance to enable the forestry authorities to perform actions on behalf of the owners, thus avoiding illegal occupation and its registry inscription and, thus, usurpation.

3.1.5.2.2 Demarcation and landmark setting

Demarcation is the set of administrative initiatives performed subject to a pre-set legal statutory procedure, by which, on the basis of documentation provided and under situations of qualified possession, the border lines of the forest are set and described precisely, and its areas and plan obtained, specifying the actual extent of its encumbrances and it is declared, being approved and final, according to the definitive nature of its possession status from belonging, all subject to the judicial decisions on its ownership.

Landmark setting is the consequence and material expression of the demarcation and consists of setting up boundary stones, beacons or permanent posts on the land, to mark the forest borders. In legal terms, it is the expression of the right to enclosure to which the owner of the estate is entitled to establish it under such conditions so its enjoyment may not be disturbed by anyone.

The means of performing demarcation is established in the articles of the Forest Regulation in force, which must be updated in statutory development of the future Basic Act on Forests and Forest Harvesting. The Instructions to file demarcation and landmark setting proceedings have been published.

3.1.5.2.3. Occupations, rural servitudes and other Royal Rights.

There are a series of activities whose performance requires physical occupation of a fairly large area of land, depending on the type of activity. The articles of the current Forest Act provide the proceedings to be followed for such files.

Occupation in forests catalogued as Public Utility is an autonomous legal figure inhere to the special forest laws. As occupations are not equivalent to administrative concessions or royal rights, these may not be registered at the Land Registry, nor may they be recorded by a Notary Public or be mortgaged.

Occupation is the ideal procedure to harmonise installations of a varied nature in the forest and to use the areas or plots for the most diverse purposes with the guarantee of execution of the relevant projects through adequate plans that avoid speculation with the land and premature, even sterile, delisting, if the occupying activity does not succeed in practice,



in areas taken from the protection regime to which the legislator has wished to subject them for the purpose of the direct and indirect benefit provided by being included in forest land for public use.

Occupations in private interests are subject to the normal regime of concessions of other types of public land, by payment of the relevant fee, without any possibility of ownership or possession rights being acquired by the holder.

In the case of occupations in the public interest, one would have to estimate the prevalence of the activities that are to be carried out on land declared of public utility to a specific end, and in that case the industry legislation may avoid the clash under these circumstances by adding channels to solve these problems through economic compensation for the temporary occupation.

A specific case is that of telephone and power lines, which have special laws granting them public utility status, and thus the concession-awardee firms, although private, may file proceedings to enable the responsible authorities to inchoate the relevant prevalence and occupation procedure.

There are a series of activities whose raw materials must be obtained from the uncultivated land, mainly forests. This is the case of construction materials such as sand, gravel, stone, etc., or mining output. In order to extract these products, a permit must be obtained from the Department of Industry as well as the relevant Forestry Authorities when the forests belong to the Public Authorities (State, Autonomous Communities, Deputations, etc.).

The amount of sand, gravel or stone extracted from the slopes is fairly considerable and has grown in recent years due to the increase in public infrastructure works in Spain which, in any case may, with the due precautions, contribute to the economic profitability of a forest, as long as it is not damaged by this.

In any case, the activity is subject to prior environmental impact evaluation and requires the appropriate corrective measures once the extraction process ends, so its environmental impact is kept to a minimum.

3.1.5.2.4. Conclusions

Due to the important role the Catalogue has played and continues to play in the legal protection of forests, to the extent that in many protected natural spaces, the present party lines practically coincide with the historical ones of Public Utility Forests and, as Public Utility Forests are a figure in the Spanish Strategy for Conservation and Sustainable Use of Biological Diversity that may be used in territorial planning, with a major ecological potential, the Forestry Strategy must not avoid undertaking the same necessary updating,



modernisation and computerisation for the services rendered to fully comply with the requisites of security and efficiency the Constitution requires of the Authorities.

3.2. ACTIVITIES IN THE INDUSTRY

Industry initiatives fall into five main blocks:

1. **Maintenance and creation of grids** of plots to enable the Autonomous Communities to liaise with each other and the National Government to obtain data and implement constant improvement techniques to evaluate the forests and achieve sustainable management.
2. **Co-ordination of the initiatives** that, due to their exceptional nature, or to the marginal economic value of the co-ordination, require resources to be pooled, such as pests, fires or research.
3. The **major plans** in which forestry has a special environmental nature, such as hydrological forestry, combating desertification, and the struggle against the effects of the climatic change.
4. **Promotion of economic and social profitability of the forests**, encouraging the production sector, recovery of rural zones and promotion of tertiary uses of the forests.
5. **Environmental education** as a horizontal instrument to create awareness.

3.2.1. Networks for constant improvement of forest policy

Experience shows that experimentation with forestry evaluation and management techniques must embody the need to avoid future disfunctions between the different Regional policies.

The proposal of this Forestry Strategy thus consists in the State and the Autonomous Communities co-operating in financing and managing those networks which must operate with absolute, strict respect for the responsibilities article 149.1.8 of the Constitution and the Statutes of Autonomy grant the Autonomous Communitys, although indeed taking advantage of the powers of ownership of certain forests to which all the Authorities are entitled as holders, some to a greater and others to a lesser extent. The Autonomous Communities must be entitled to declare a zone as part of any of the networks and perform the necessary work while the criteria of co-ordination and financing are administered by a joint committee.

In some cases, as in that of the Unique Forests Network, its purpose is basically that of environmental education and legitimisation of the cultural function of some forest stands. In the remaining ones, the networks try to avoid the economic costs of investment in all the Autonomous Communitys by pooling their efforts, when the marginal yield from the investment is potentially much greater if the financial effort is pooled. In some cases, such as that of the Data network, the need to establish, or rather maintain these, is due to undertakings to the European Union.



These networks will be as follows:

3.2.1.1. Forest damage monitoring networks

Due to international requisites, Spain must monitor the state of its forests in relation to the atmospheric contamination, on two levels at present, pursuant to the Geneva Convention on Long Distance Transborder Pollution, as well as different European Union regulations. That information is also basic to ascertain not only the resistance to soil acidity, but also to measure the stress that may endanger the different forest stands. Level I controls the indicators; Level II performs greater depth analysis of the causes, that is to say, of the interactions between these and other indicators. Moreover, as has been shown in Sect. 10.3 of Part One, this network is not the only one there is.

Due to its supra-regional and even international nature, the National Government will continue to manage the information networks to co-ordinate the information the overseas policy authorities must handle and to also provide data on the state of the forest stands to the Autonomous Community in which these are located, which normally performs additional tasks to support the network management.

Moreover, the need to prepare and maintain an information network on exchange of gasses according to the methodology required by the international Climatic Change Convention managing bodies requires new duties to be assigned to these networks.

3.2.1.2. Base Materials Network for Forest Genetics; Conservation of forest genetic resources.

The production time required by forest species prevents the user of the seed or plant to evaluate the quality stated in the document of purchase. Due to this, the Community Directives on the matter establish a regulation system to identify the material and a control system in the different procedures for production and collection, extraction, storage and/or nurseries, and for marketing, which are essential to guarantee the quality of the stand and to protect the user.

The 1st Ministerial Conference for Protection of Forests in Europe⁹¹, Resolution S2, proposed the creation of an instrument for international co-operation in conservation of the genetic diversity of the European Forests. In order to fulfil this resolution it developed the EUFORGEN programme, of which Spain is part, participating in the networks for *Quercus suber*, *Populus nigra* and broadleaved noble species such as the elm, chestnut and other species.

⁹¹ *Strasbourg, 1990*



The National Government is to implement nation-wide programmes to establish the genetic improvement to be performed, for the relevant species in each case, generally expressed through optimisation of some set quality parameters related to the objectives aimed at, whether harvesting of timber, cork, resin, mushrooms, truffles, fruit, etc., for adaptation to the environmental conditions, resistance to diseases and pests, or any others. In order to develop these improvement programmes, the National Catalogue of Base Materials must be continuously updated, based on forests of known origin, choice masses and rolls, clone banks and seed orchards, dedicated to obtaining forest material for quality reproduction, as well as the tests aimed at studying these and their adaptation to the environment, progenies and origin tests.

To support execution of these programmes, a Network of Centres for Forestry Genetic Improvement, assigned to the Directorate- General for Nature Conservation, has been created through collaboration between the Forestry Research Centre, the National Institute for Agrarian Research and the Polytechnic University of Madrid, where the improvement plantations are located, formed by the Centres at El Serranillo (Guadalajara), Valsain (Segovia), Puerta de Hierro (Madrid), Alacuás (Valencia) and La Almoraima (Cadiz), the dependence of which has recently been clarified by the judgement by the Constitutional Tribunal of 25 February 1999.

The regions of origin of the forest species of greatest interest Spain have been defined, materialised in a series of publications used by the forestry services of the Autonomous Communitys as an instrument to require adequate use of the forestry material for reforestation reproduction. The National Base Material Catalogue has also been prepared, which is obligatory in the European Union as an integral part of the Common Catalogue, and diversity studies have been carried out with origin and progeny tests, use of the genetic markers of the main forest species, and lastly, work has begun on conservation of genetic resources.

Within the framework of Resolution S2 by the Ministerial Conference of Strasbourg and the Convention on Conservation of Biodiversity, there must be a network for improvement and conservation of the forest genetic resources, the basic objectives of which to be considered will be:

- § An inventory of the gene pool for future generations, which is one of the priority objectives and must be subject to a specific nation-wide strategy.
- § Initiatives to conserve those populations, which shall be performed by combining off-site conservation techniques with storage of seeds, and periodic renewal of the batches and others on-site, as well as establishing plantations and clone banks, which must be co-ordinated with the relevant Autonomous Communities.



- § Determination of the fundamental characteristics of the forest reproduction materials, their genetic and physiological quality, as well as development of the basic legislation applicable to these.
- § Preparation of the genetic diversity studies on the main forest species in relation to their use in reforestation and as an indicator of the diversity of the forest species.
- § Preparation of programmes to conserve genetic resources as an essential aspect of maintaining the biodiversity of the forest ecosystems, which requires, on one hand, determination of the species subject to regulation, and on the other, specification of the regions of origin, and study of the variability of each one of them and of the regions for identification and use of the forest material in reproduction.
- § Information exchange with other international bodies to coordinate in determining the quality criteria required of the plants used in the reforestation, especially those from the Mediterranean.

3.2.1.3. Special Forest Preservation Network

Apart from the land included in the National Parks network, there are some unique Spanish forests which, although not declared as integral reserves, have or should have a certain amount of protection. In the north of the Iberian Peninsula the most interesting woodlands are those of Fragas del Eume, Ancares in Lugo, Somiedo, Sierra del Cadí, Valles de Larra, Bosque de Irati, Muniellos and Saja. In the centre, the most interesting areas with some kind of protection are the Valsaín pine forest and Sierra de Gredos, and in the south there are three outstanding natural spaces: Grazalema, Cazorla and Sierra Morena de Andújar. The special value, as natural cultural heritage, of these and other forests of similar characteristics, management of which is the responsibility of the Autonomous Community where they are located, makes it highly recommendable to create a forum or group to exchange management experiences between these forests and their surroundings in order to prepare recommendations within the setting of co-ordination between the National and the Autonomous Communities, and to make the whole of society aware of their most special value.

This Forestry Strategy considers the creation of such a network, which at no time would modify the responsibilities to manage these spaces. Maintenance of the functioning costs of the network and when appropriate financing of emergency initiatives when the health or very existence of one of these areas is endangered, will be assigned to the National Government, in collaboration with the Autonomous Communities.



3.2.1.4. Natural Forest Ecological Monitoring Network

Preservation of natural forests may be undertaken alone, or as part of a more ambitious programme to set up a network of natural woodland reserves in Spain, which is coordinated with the Action COST E4 on Forest Reserves in the European Union.

Creation of this Network should be aimed at improving engineer of the situation of the natural forests, based on the existing information.

To perform this, the authorities must:

- § Ensure that this Network includes not only those representing Old Growth Forest, but also Ancient Forest, both categories related to the duration or continuity of the forest on that site and of the primary, natural, semi-natural and secondary forests, according to the categories related to the origin of their development.
- § Establish an adequate Nation-Autonomous Communities Committee, to propose the most appropriate means for the owners and managers to obtain better knowledge of the state of conservation of the forests forming the network.
- § Perform a national inventory of the natural forests.
- § Approve planning and management recommendations, or recommendations of measures that promote the inclusion of the owners in the active management of the forests in the Network.
- § Encourage research in the Forest Reserves, as well as co-ordination between them.

The Autonomous Communities would be in charge of establishing the management models and criteria for these forestry reserves, following the - non binding - recommendations of the Committee. the National Government would take charge of the costs of maintenance of the Network and of its operativity.

3.2.1.5. Network of Ecologically Fragile Areas

Apart from the unique forests and protected natural spaces, Spain has a series of enclaves, generally small areas, which host important ecological values that have not been subject to any specific legislation. They are usually very scattered and deep in the countryside, frequently in areas dedicated to agricultural crops on river banks. This dispersal and their small size makes them subject to aggressions that may lead to their disappearance, thus damaging the overall ecological, historical values of the zone where they are located,



and the relevant national global values. In any case, their assessment through a Network co-ordinated by the State and the Autonomous Communities seems necessary.

These ecologically fragile zones must be inventoried, including their general features and those that provide them that status, as a first step for the Forestry Industry Conference to later decide on the creation of an institutional framework to co-ordinate the policies to be implemented by the Autonomous Communities, or design and apply the appropriate protective legislation according to the results of the inventory.

3.2.1.6. Experimental network for sustainable forest management improvement

At the 3rd Ministerial Conference on Forest Protection, held in Lisbon in June 1998, Spain signed resolution L2, which contains the list of pan-European criteria and indicators for sustainable forestry management, and the pan-European directives for sustainable management at forestry operational unit scale.

The text of the Resolution adopts the criteria as such and undertakes the common indicators, showing the need to continue to progress in definition in these, and thus in the concept of sustainability in forestry management.

The six pan-European Criteria adopted, which are the characteristics of the forestry spaces that must be fulfilled, in order to say they are managed in a sustainable manner, are:

- ∅ CRITERIA 1. Maintenance and promotion of the forest resources and their contribution to regulation of the global carbon cycles
- ∅ CRITERIA 2. Maintenance of the health and vitality of the forest ecosystems
- ∅ CRITERIA 3. Maintenance and improvement of forest productivity (timber and non timber yielding)
- ∅ CRITERIA 4. Maintenance, conservation and promotion of biodiversity in the forest ecosystems
- ∅ CRITERIA 5. Maintenance and strengthening of the protective functions of the forest management (mainly of the land and water)
- ∅ CRITERIA 6. Maintenance of other socio-economic functions and influences, such as those related to the landscape, recreation, education, wildlife, health, etc.

Moreover, a set of values is required whose value and above all evolution, permits the decision on whether or not these criteria are fulfilled, which are called indicators. The set of indicators approved in Resolution L2 contain two classes, as there are some of a quantitative



nature, thus measurable, and others of a qualitative nature, that may only be used by comparison on a time scale.

Due to the varied nature of European forests, where some belong to several biogeographic regions that are so different one from another such as “taiga” conifer forests of the Urals and the semi-desert Mediterranean basin in Almeria, it is logical for the national indicators to be different in each case, although these must be included in the pan-European list in order to be able to compare both.

In the case of Spain, that adaptation of the pan-European indicators to our conditions would have to be performed in three phases:

- § Determination of which pan-European indicators may be used directly as national indicators, without any variation in their definition and application, and which are irrelevant and do not provide any information whatsoever, so they must be eliminated from the national set.
- § Variation in the definition and/or form of application of the others that do not adapt to the conditions of our forests to achieve a reliable record.
- § Addition of other indicators not considered in the pan-European set, but which may be necessary to show fulfilment or not of any of the criteria.
- §

As stated in the Resolution, given that sustainability is conceived as a dynamic concept that is in continual evolution, the set of national indicators must be constantly under review to improve their usefulness and show the conceptual changes that may arise in them.

As all this process involves field data collection over a long period of time, and the need for the different measurements to be comparable, this Forestry Strategy proposes the creation of an Experimental Network of Sustainable Forest Management Improvement, within the setting of co-ordination between the National and Autonomous Communities, to provide physical support for this programme.

The Network would be formed by forests belonging to the different zones of Spain, of different ownership, public and private and of different management patterns, which shall join it on a voluntary basis, undertaking to provide the information requested. A centralised data base will be created to gather all the information, which shall be used by the State Forestry Authorities and the Autonomous Communities for the aforementioned purposes. The results of the process, along with the information from the data base would be available to the members of the network.



The National Government would take charge of the costs of maintenance of the Network and its operation.

3.2.2. Co-ordination of supra-regional interest management

Although management of the forest policy falls entirely within the responsibility of the Autonomous Communities pursuant to articles 149.1.23 and 148.1.8 of the Constitution and Statutes of Autonomy, there are three areas in which these regulations impose the need for co-ordination in horizontal titles⁹².

This makes it necessary to maintain the present co-ordination in forest fires fighting, pests and in plant health, and to establish co-ordination mechanisms for forestry research.

3.2.2.1. Forest Fire fighting

The high level of fire hazard requires an integrated forest policy which includes the following bases for ongoing prevention action:

- ∅ The risk must be recognised as permanent due to the socio-economic conditions, and recurring due to the weather conditions, which requires:
 - § Awareness amongst the populations who influence forests
 - § Conciliation of concurrent interests in forest land
 - § Watch of the areas

- ∅ Recognition of the role of fire in the evolution of forest cover, which must be based on:
 - § Fire prevention, integrated in the harvesting and management plans
 - § Regulation of the use of fire to pasture, shrubbery, and agricultural burnings avoiding their criminalisation through controlled burning programmes performed jointly by the local population and the Authorities.

- ∅ Recognition of the complexity of extinction work in forests, which require a knowledge of the land as well as the dynamics of forest fires, using the most varied resources, which oblige:
 - § Co-ordination procedures for the first attack

⁹² Articles 149.1.10^a, 15^a, 16^a and civil protection



- § Co-ordination procedures to fight major fires
- § A co-ordinated staff training and endorsement system to be able to make such procedures possible

On the basis of the conclusions to the reports approved by the Senate in 1993 and 1995, as well as the Red Books on Prevention and Co-ordination drafted by the Forest Fire Fighting Committee (CLIF) in 1997, the general objective is to provide a strong drive to prevention which will allow reduction of the number of fires and limitation of fire impact on the forest area. To specify this, the following strategic objectives are set:

- ∄ Action on the causes, whether immediate or structural, that lead to the appearance of fires, to reduce the number of events to the inevitable ones due to natural cause or accidents.
- ∄ Intensification of fire prevention by applying techniques that reduce the forest stands' combustibility and thus make them more resistant to fires.
- ∄ Maintenance of the present extinction potential, with the necessary improvements that allow the level of efficiency reached to be improved as far as possible.

These objectives must be developed through co-ordination between all the Authorities, within the framework of the legal distribution of responsibilities, to the Autonomous Communities as well as the bodies of the National Government. One must also bear in mind the lines of the CAP⁹³ which may influence the forest environment. The following tactical initiatives are proposed in order to develop these objectives:

Initiatives related to causes

- § Improvement of the cause identification systems, to reduce the percentage of those classified as unknown, through special training of teams and co-ordination with such bodies as the Nature Protection Service of the Civil Guard and other regional security forces.
- § Research into the possible reasons for intentional fires (agricultural and pasture burning, labour conflict, problems related to game hunting, conflicts arising from declaration or management of protected spaces, economic, town planning or industrial interests, revenge, etc.).
- § Introduction of by-laws to dissuade the use of fire for economic interests and application of the penalties foreseen in the forestry legislation and the Penal Code.

⁹³ EU Common Agricultural Policy



- § Awareness among the population to avoid fires being lit in forests, through permanent campaigns in rural areas and those aimed at school children, as well as seasonal campaigns aimed at the urban population and other visitors to forest areas to inform and warn them of the danger.
- § Review of the possible undesired effects of applying Community extensive stock farming subsidies systems which may lead to indiscriminate scrub burning.

Initiatives related to prevention and watch systems

- § Reinforcement of mobile watch for the purpose of dissuasion, encouraging establishment of municipal patrols in the highest risk areas.
- § Reinforcement of co-operation between the Ministries of Defence and Internal Affairs for better use of the Armed Forces in watch and extinction tasks, improvement of their training and establishment of co-ordination systems.
- § Promotion of volunteer associations for preventive watch.
- § Promotion of forestry association to intensify fire prevention (fuel breaks, diversification of species, controlled burning, etc.) on private and public forests, and reinforcement of the protection infrastructure (water points, tracks, small air bases, etc.).
- § Subsidies for the forestry work and preventive infrastructures provided by the Autonomous Communities through the P.A.P.I.F (Preventive Action Plan against Forest Fires).
- § Extension of the risk and fire behaviour prediction systems by reinforcing the forestry meteorological network in co-ordination with the National Meteorological Institute.
- § Monitoring fire danger through detailed statistics (EGIF data base), continuing application of remote sensing to evaluate damage and determine risks.
- § Monitoring application of subsidies for Reforestation of Agricultural Land, in order to carry out the appropriate preventive silviculture tasks, as well as to consider fire hazard in the choice of species.

Initiatives related to fire extinction systems



- § Maintenance of the fleet of amphibious aircraft and helicopters for general air cover, in collaboration with the Air Force and Civil Guard. The coverage must still be supplemented by chartered planes and helicopters.
- § Improved co-ordination to deal with major fires through the Aerial Co-ordination Units, Mobile Weather Units and Transmissions and Reinforcement Brigades (BRIF), which shall be increased in number to achieve nation-wide coverage.
- § Improvement in decision taking systems through application of computerised fire behaviour prediction and simulation systems and resource management to specific areas.
- § Improved training for the personnel involved in extinction, by establishing a standardised course system in collaboration with the Autonomous Communities, with emphasis on efficiency as well as on safety for that personnel.
- § Establishment of a system to endorse materials and equipment through the Forest Fire Fighting Committee (CLIF), to guarantee quality and improve the scale economies of the tender contracting by the different Authorities from their respective budgets.
- § Periodic review of the danger indicator indexes, to constantly adapt these to the real conditions in each specific zone.
- § Checking the efficiency in each case of the two extinction systems now in each, one based on urban firemen, and the other on duly specialised rural staff, in order to take advantage of one and the other as appropriate in each case.
- §

Initiatives related to economic damage minimisation

Although traditionally there has only been coverage for the personal damages to those called on to participate in fire extinction (modernisation of the Compensation Fund), it is increasingly usual to extend the coverage of private insurance to the economic damage caused by fires. Moreover, it even goes beyond this to cover other risks - wind, snow, extinction expenses, etc. - using different means of evaluation based on the costs of clearing and reforestation and/or evaluation of forest yield and/or landscape, ecological and socio-economic aspects of the forest. Private forest insurance is thus another tool that is included in forestry management in other countries and provides advantages to private and public companies and owners, as it allows protection of the forestry assets or yield.

Indeed, articulation of such a policy is complex, as the scarce economic profitability of the forests works against their insurance. However, to the extent that private insurance assumes the possibility of articulating measures to compensate for damage to the actual forest



stands, it is probable in the mid-term to consider a policy of subsidies for insurance premiums or some other kind of incentive. The authorities should also study the convenience of establishing compulsory reforestation insurance based on the cost of clearing and reforesting the areas affected by a fire when this strips an area of Public Utility Forest. A special working group should be established to monitor these trends which in due time, could lead to such a subsidies policy being considered appropriate.

In this sense, the working group could study the possibility and convenience of establishing a public fire insurance scheme which could cover the gaps left uncovered by private insurance, in the same way as public insurance for agricultural crops.

Other initiatives

The Fire Fighting Committee must be open to other possible, less conventional, initiatives, such as limiting reforestation in high fire risk zones, or co-ordination with the agricultural policy to encourage ploughing and cultivation of vines, nuts, hemp or other non-combustible crops in areas declared as high strategic interest as a fuel breaks.

3.2.2.2. Defence against pests and diseases

Forests must be protected against any disturbance that may endanger their survival, their biodiversity, or prevent or detract from the use to which they are assigned. In this sense, pests and diseases play an important role in weakening the balance of the forest ecosystem, which must be avoided.

Protection must preferentially be of a preventive nature, through continued monitoring of the state of health of the forest systems, their analysis, development of action techniques, preferably forest cultivation and biotechnology, which prevent or check imbalances which may arise in the forest systems. Application of integrated hazard fighting methods must be an efficient supplement to that preventive work.

It is a joint task of the National and Autonomous Communities to develop the necessary measures for watch, location and control of imbalances that affect the development and survival of Spanish forest ecosystems. In order to achieve this, the Forest Authorities are responsible for conserving the health of their forests, and maintaining the natural balances arising in them, using the necessary procedures which, without having a negative effect on those ecosystems, guarantee their survival and future development.

The forest authorities must obtain up-to-date, detailed knowledge of the existence of factors upsetting the balance of the forests, and provide measures to avoid damage that may affect the survival of the forest ecosystems.



The main steps the Spanish forestry authorities must take to protect the forest ecosystems and their biodiversity, in close collaboration with the Autonomous Communities, are:

- § Detection and monitoring of the evolution and dynamics of the main harmful agents that affect the forest ecosystems.
- § Detection and monitoring of new problems that may interfere in the natural dynamics of Spanish forests.
- § Trial of biotechnological, silviculture and natural control techniques that contribute to maintaining the balance within the forests.
- § Technical support and logistics required by the Regional Government Forestry Services for the control of forest health problems that may arise, and in co-ordination of initiatives when the situation exceeds the territorial coverage of an Autonomous Community.
- § Exercising the responsibilities and functions required for the external health of forest products, taking the necessary measures to avoid introduction and dissemination of the damaging agents within the territory of the State, as well as those which require fulfilment of the international treaties.
- § Recording the phytosanitary products to be used in the forests.

Co-ordination with the Damage Network is essential to achieve this. However, and pest and disease related matters, co-ordinated action must be established by the relevant committee or delegate working group of the Industry Conference to establish the relevant initiatives to be undertaken by each one of the Authorities.

Correct evaluation of the health of the Spanish forests has another amount of undoubted importance: control of external sanitary factors. Under the present laws, the responsibilities in overseas health matters are assumed by the Directorate General of Agricultural Production, which reports to the Ministry of Agriculture, Fishery and Food. The relevant bodies of the Autonomous Communities must report to the Subdirector General for Plant Health on the presence of organisms under quarantine in the country, that is to say, *those that have a potential economic importance to the endangered area where the pest does not exist, or if it exists, is not widespread and is under official control*⁹⁴ as well as others that have not yet been declared and which are not present in the territory of the European Union, but which may cause a danger to its crops or forest stands.

There are official reference laboratories to which the aforementioned Subdirector General for Plant Health sends the plant samples or parts of them with signs of having been

⁹⁴ Definition used by the FAO



attacked by any of these agents. These laboratories renew a Collaboration Agreement with the Subdirectorate on an annual basis, and the samples may be sent by the plant health depots of the Autonomous Communities or through the Subdirectorate General for Plant Health. The Service for Protection against Harmful Agents at the Directorate General for Nature Conservation must also report the presence or suspected presence of these organisms when these are noted while it is performing its duties, for example on health inspections of the forests managed by the Directorate General for Nature Conservation, or when checking the points and plots of the European Networks.

3.2.2.3. Forest research

Development and application of the Forestry Strategy must be backed by a solid base of permanently updated scientific knowledge that must be provided by forestry science, through scientific research and technological development. Only thus may it respond to the international commitments and apply efficient sustainable management techniques, stimulated by new knowledge and experiences in a constant innovation process, and satisfying the demands at each moment.

The National Plan for Scientific Research and Technological Development establishes the major research objectives in the scientific, technological and industry areas that must be fully or partially financed from the general state budget. The Interministerial Commission for Science and Technology (CICYT) is the body for planning, co-ordination and monitoring of the National Plan. The different fields R+D within the National Plan consider the specific objectives of each sector.

In order to facilitate inclusion of preferential lines of action in the National Plan, it is considered necessary to have a co-ordinated system that identifies the different interests of the forestry sector at each moment. To achieve this, the appropriate channels must be established to include the contribution by the political and administrative officers, the owners and managers, the companies and industries, the social partners and environmental organisations in the task of identifying the problems that arise in the achievement, improvement and sustainable management of forests, production of resources and benefits to the rural environment, as well as the processing, marketing and environmental adaptation of the forest products. This mechanism must also provide co-ordination of the criteria for action with and between the Autonomous Communities, in order to achieve maximum efficiency for the overall scientific and economic resources assigned by each of the Authorities.

This mechanism must also be used to co-ordinate the criteria and experiences of the Autonomous Communities, under whose responsibility a major part of the forestry research is carried out, in order to achieve the greatest possible efficiency for all the scientific and economic resources assigned to it.



The National Government shall collaborate with the Autonomous Communities to maintain the framework of this system, co-ordinating the exchange of knowledge and information on the results of research carried out by the set of all the R+D teams, in order to optimise their application. To that end, it shall develop a system of access to the information, maintaining the necessary data bases and encouraging training in new technologies.

Support for a Spanish Forestry Strategy in which all the Authorities must participate in a co-ordinated manner, with criteria of sustainability and multifunctionality, unavoidably requires a Forestry Research Programme to be prepared. On the other hand, this Programme would help to correct the structural weakness of the forestry sector and to evaluate the environmental and social benefits, in addition to the economic ones of some renewable, defective ones, as well as allowing one to overcome the scarce critical mass of the staff teams by taking on new researchers.

The lines of research must thus aim to provide solutions to the ecological and socio-economic problems arising in our forests, as well as to application of the criteria of sustainability.

The National Government's bodies with responsibilities in forestry matters, duly co-ordinated with their are departments and those responsible for technological devolution to the Regions, shall design a means of access to the information and dissemination of the results of the forestry research to be carried out, maintaining the necessary data bases and encouraging training in new technologies and application of the new knowledge.

In any case, the co-ordinated system shall have the main purpose of providing content to the relevant part concerning forestry in the scientific-technological section 5 (Agricultural-Fishery Resources) of the Proposal for Identification of the Industry Scientific and Technological Fields of the National R&D Plan (2000 – 2003) which is being prepared by the Office of Science and Technology of the Governmental Presidency. It shall also identify the strategic projects that may be included in the potential sectorial areas of Tourism and Leisure (Area 1), Cultural Heritage (Area 3), Space⁹⁵ (Area 6), Town Planning and Land Management⁹⁶ (Area 10), Energy⁹⁷ (Area 13) and the Environment (Area 16).

3.2.3. Special Environment Plans

Environmental problems of global relevance are closely related to forest policy.

Climate change is still subject to scientific uncertainty. Nevertheless, in application of the precautionary principle and considering that Spain must act within the European and global policy, it must be taken into consideration. The other two main problems are part of the world-wide action to combat desertification, as soil erosion in Spain is the main problem tending to cause that phenomenon.

⁹⁵ *Related to the technology to identify processes of desertification and fire fighting.*

⁹⁶ *With respect to mapping*

⁹⁷ *With respect to biomass*



3.2.3.1. Protection against Climatic Change

The information from the Intergovernmental Panel on Climatic Change (IPCC) indicates that the concentration of CO₂ in the atmosphere has increased from 280 ppm in 1800 to 358 ppm in 1994, that is to say, almost 30 per cent. This increase is due to human actions, mainly burning fossil fuels and to changes in land use. During the 1980s, the anthropogenic emission of CO₂ around the world was estimated at 7,100 million tonnes of carbon per annum; 5,500 million tonnes due to fossil fuel burning and cement production, and 1,600 million tonnes of net emission due to changes in soil use, fundamentally due to deforestation of tropical areas.

From that annual emission, 3,300 million tonnes are accumulated in the atmosphere, 2,000 are absorbed by the oceans and 500 by growth of the biomass of the forests in the boreal hemisphere. The remaining 1,300 are estimated to be absorbed by the land ecosystems.

The Present calculation is that the amount of carbon stored in forests is approximately 700,000 million tonnes, and that a hectare of woodland contains from 100 to 200 tonnes of carbon and its growth fixes about 5 to 10 tonnes per hectare per year, although the experts' forecasts are still pessimistic, especially in our Mediterranean area where through the period 1993-1995 we noted the devastating effects of drought and high temperatures on our forests.

In spite of the measures taken to reduce emissions, the forecasts point to a more than likely increase in greenhouse gasses over the coming decades, due to the increase in population.

These figures give an idea of the importance of healthy forests as a warehouse and sink for greenhouse gasses, although this is not sufficient to prevent climatic change. One must not forget that deforestation and combustion of biomass, including fuelwood, also contributes to increase those gases.

Spain's international obligations in this field lie within the framework of the Kyoto Protocol, by which the developed countries decided to decrease emission of six gases, the most important of which from the forestry point of view is CO₂ and to a lesser extent CH₄ and N₂O. This Protocol has expressly recognised, in spite of scientific uncertainty, the function of forests as a carbon sink. Thus, countries whose forest area has decreased since 1990, the year taken as the basis to calculate the emissions, may be penalised according to article 3.7, as to their emission capacity.

Thus, the Forestry Strategy must allow the due priority to determining the forest areas liable to absorb carbon either in 1990, and monitor the areas deforested and later reforested to avoid a hypothetical decrease in the total area leading to increased reduction of permitted CO₂ emission, as this is the policy agreed within the European Union as a vehicle to fulfil the obligations undertaken in Kyoto.



It is evident that the increase in the total forest area must be an object for achievement, as it has other additional advantages for the living standards and development of Spain.

Experience in recent years has shown the effects of a period of drought on forests, which may be according to the forecasts of the panel of expert on climate change. Damage to natural vegetation has been noted, hardy species have been found to be fragile and others considered sensitive have satisfactorily withstood the adverse conditions. Thus, climate change may not only be mitigated by forest policy, but also forest areas are obviously affected by it in a very negative sense.

Programmes must urgently be set up to research the ecology of forest species, as well as the selection of strains which resist the conditions foreseen by the experts, to prepare strategies to cushion the effects of climate change.

To this end, in addition to increasing forest areas, setting quantitative reforestation objectives, one would have to stimulate co-ordination between the Forestry Authorities and the different national and international research centres, in order for the former to have access to the available information on gas exchange in forest areas, and also to encourage studies of the drought resistance of different forest species and the buffer strategies for the effects of a climatic change on forest ecosystems.

3.2.3.2. Hydrological-Forestry Restoration

Adverse relief and irregular rainfall in amount and time make torrential phenomena arise unforeseeably all over Spain, especially when there is inadequate plant cover.

The consequences of these phenomena, which include water erosion, sedimentation and violent flash floods, lead to loss of soil, loss of the quantity and quality of water, silted up reservoirs, catastrophic flooding and water eutrophisation.

The Hydrological-Forestry Restoration activities seek the following induced effects related to protection of the basic water and land resources:

∕ Soil protection-related effects:

- š Decrease in loss of soil due to denudation
- š Maintenance and improvement of soil structure, cohesion and moisture



- § Increase in soil permeability, penetrability and oxidation and hydration capacity
- § Conservation of the stability of the natural nutrients of the soil

∄ Effects related to water protection:

- § Improved regime of surface run-off
- § Increased time of water concentration in the river beds
- § Favouring snow adherence and lying on the ground.
- § Increased horizontal precipitation and heterodox water input
- § Improved water quality and decrease in solid flows.

∄ Other socio-economic and environmental effects

- § Attenuation of torrential run-off and subsequent catastrophic damage
- § Maintenance and improvement of the quality of the habitats and their biodiversity
- § Atmospheric 'lung' effect of the vegetation
- § Aesthetic and social effects, ecotourism, rural stability
- § Protection of village infrastructure, dams, roads, etc.
- § Indirect economic benefits, such as generation of renewable products
- §
- § These initiatives, conceived overall for each catchment basin, cover four types of activity:
- §
- § Reforestation work to create protective plant cover
- § Silviculture treatment to maintain and improve the previously existing vegetation cover
- § Hydrotechniques to correct river courses and cliffs
- § Management and correction work in especially degraded and/or threatened river basins



As the present system is based on bilateral co-operation agreements for hydrological-forestry restoration of river basins, expressly negotiated with each Regional Government, based on the distribution of responsibilities brought about by the Royal Decrees of 1984-85, and due to the low juridical ranking such by-laws have in the set forming the juridical framework of the constitutional laws, the future Basic Act on Forests and Forest Harvesting should restructure the initiatives in order to ensure that the loans available from the Authorities cover initiatives in the basins which are considered absolutely necessary for the Basin Plans approved by the National Hydrological Plan, acting as a solidarity fund to prevent and avoid either endemic problems, or further reaching natural catastrophes.

For this purpose, a mixed body shall be formed by representatives of the Autonomous Communities, the State Secretariat for Water and Coasts, the Water Boards and the Directorate General for Nature Conservation, to prepare and apply the National Forest Hydrology Plan, the priority of which shall be infrastructure initiatives in the territory when erosion is causing clear catastrophic effects, such as flooding in the cities, for example, soil degradation tending toward desertification or massive loss of work as the land has lost the capacity to regulate the water cycle, all according to a system of duly agreed objective indicators. This Plan shall involve the relevant estimate, in which all the parts shall intervene, and although it is included as part of the National Hydrological Plan, or within the Programme of National Action against Desertification, under no circumstances may one suppose that responsibility for its execution lies solely with one of the parties- the Water Boards or the Directorate- General for Nature Conservation, as appropriate.

3.2.3.3. Fight to combat Desertification

Desertification is understood as *degradation of the soil in arid, semi-arid and sub-humid dry zones due to diverse factors, such as the climatic variations and human activities*⁹⁸. This soil degradation is materialised through diverse processes such as erosion, deterioration of the physical, chemical and biological properties, or of the economic properties of the soil, and lasting loss of natural vegetation. More than two thirds of Spanish land is liable to develop desertification processes. In fact, 40% is affected and 18%, which is equivalent to 9 million hectares, is undergoing severe desertification processes⁹⁹.

The dilemma of desertification is not restricted to the field of forestry but, as a real process, is formed by numerous factors and sectors, specifically the agricultural and hydrological ones, although the struggle against desertification in the field of forestry must not be understood as a simple increase in natural plant cover in the degraded areas. It includes conservation and restoration of the resources soil, water and vegetation, as well as sustainable development of the arid and semi-arid zones.

⁹⁸ *United Nations Convention to Combat Desertification, signed in 1994 and ratified by more than 120 countries and organisations, including Spain and the European Commission.*

⁹⁹ *Draft of the National Plan of Action against Desertification.*



Within resource conservation, one may consider conservation and recovery of the biodiversity in representative natural communities in the arid and semi-arid zones of the Mediterranean. This does not exclude hydrological-forestry restoration interventions in especially degraded sub-basins where all traces linking them to their theoretical original situation have been lost, and where it is necessary to correct severe imbalances in the water resources that lead to flooding and almost total loss of the natural regulation. Thus, due to its importance in Spain, it must form part of a special plan, such as that described in the previous section.

From the point of view of the National Government, specifically the Ministry of Environment, the fight against desertification has been instrumentalised up to date through the project Fight against Desertification in the Mediterranean (Lucdeme), created in 1981 in order to determine the causes and processes, to explore the indicator systems and possible restoration formulas.

The Fight against Desertification Convention and the actual reality of the south east and other areas of Spain impose, however, the need to articulate a National Action Plan against the spread of desert land which, in addition to including the Hydrological-Forestry Plan, will co-ordinate initiatives by other Departments and be included, in turn, within those foreseen in the Water White Book.

Monitoring and evaluation. The starting point to check desertification is knowledge of its real and potential development within the territory. A Network of Erosion and Desertification Monitoring and Evaluation Stations (RESEL) have been set up to achieve this, under the Lucdeme Project. The network is now formed by 41 experimental fields in the desert threatened landscapes of Spain, soon to be extended with new stations and complemented by information from other tools, such as remote detection and inventories, data bases and thematic cartography of the natural resources produced by the different bodies. The information obtained is processed and made available to the bodies related with the planning and execution of initiatives against desertification. The Euromediterranean erosion and desertification monitoring and evaluation network consists of the extension of the RESEL network to the Mediterranean area, within the development of Euromediterranean co-operation jointly financed by the European Union MEDA programme.

Biotechnology in arid zones. This consists of testing new crops and uses for arid zones, and in studying the feasibility of the traditional ones that have lost relevance. The objective is to contribute to development and conservation of the arid zones by making their genetic resources profitable.

Development of sustainable farming and extensive grazing systems in arid zones. The objective of this line of work is identification of the typical agricultural practices and products of arid zones and classifying the nutritional of our natural forage flora as the basis for correct estimation of incidence of grazing on the natural arid zones. This line is becoming



more important due to its possible projection to other countries in our area and its application to studies to sustain wildlife in Mediterranean counties.

The Plan will also consider co-operation initiatives, especially with the countries of the Maghreb and Latin America. It may also include initiatives aimed at revitalising the “dehesa”(grazing forests) described in Section 3.2.4.3.1.

3.2.4. Encouraging the economic and social profitability of the forests

Multifunctionality as a basic principle must not overlook the fact that all forests, especially the Mediterranean ones, are based on adequate management, and this may only be achieved if it is integrated as much as possible into an economic cycle that adds value, without forgetting, either, that the autonomy of the Autonomous Communities implies the possibility of opting for productive models that emphasise the value of the forests as a primary sector, as well as others to obtain tertiary economic yield.

3.2.4.1. Promotion of the forest industry

The duty to encourage the industry must fundamentally be assigned to the Autonomous Communities, although the State must be involved. Especially, the action by the state should be aimed at aid to reform the productive structures, favouring production of timber and other quality products and allowing small owners and workers in rural forestry or agricultural –forestry-grazing activities to obtain yields.

Due to this, the aid for diverse industry programmes by the Autonomous Communities whose activities are included in the European rural development programmes, or state programmes must form a very important part of the forest policy co-ordinated with the Autonomous Communities, the amount of public state funds used being enough to allow maintenance of the budgetary rigor.

3.2.4.1.1. Timber industry

The main structural problems are due to the small size of the exploitations, very steeply sloped landscape and, due to this, an insufficient hauling off-roads network, which considerably increases operation costs. The lack of a road network and, in general, as the forests are far from the operations, makes transport of the raw material more expensive.

The result of all this is low profitability for the producer, who is left no margin to cultivate his forest and to provide the essential silviculture to avoid its destruction in case of fire.



Structural initiatives

- § To establish the lines of Technological Research and Development that will be performed in collaboration with other Bodies, Technological Centres in the Autonomous Communities and Industries in the sector
- § To perform advertising campaigns aimed at the use of timber as a renewable, environmentally appropriate resources, based on studies of the complete life cycle of the material, which should put timber at an advantage to others.
- § To improve the forest harvesting operations, the conditions of debarking and elimination of slash, by acquiring the appropriate machinery, mechanisation of transport from felling till the timber reaches the processing industries
- § To encourage firms to apply Environmental Management Standards¹⁰⁰ regulated by the European Union in Regulation (EEC) no. 1836/93 and approved by the Spanish Standards Association (AENOR)
- § To continue to encourage implementation of Quality Seals in the sector for forest products, which are those that guarantee correct application of the UNE standards and the Eurocodes for building which are already obligatory within the European Union. An example may be the AITIM¹⁰¹ Quality Seal which also bears the AENOR *N* mark. There are now UNE standards for raw timber as well as flooring, doors, boards and wooden structures for building.
- § Modernisation and improvement of forest exploitations in order to establish technically and economically feasible management units.
- § Creation, extension and modernisation of the timber handling, storage and drying facilities, in integrated industries, or adjoining sawmills.
- § Promotion of enactment of security regulations, just as foreseen in Appendix IV of this Strategy, as, regardless of their ethical factors, they will always lead to improved productivity.

Action prior to first-stage processing

¹⁰⁰ UNE-EN ISO 14001, 14010, 14011, 14012 and their regulations such as UNE 150007:1997.

¹⁰¹ Technical Association of Timber and Cork Industries



- § To increase and improve the timber yards, as well as mechanise the tasks performed in these, with improvement in the time and conditions of decking
- § To increase and improve the wood drying conditions, in industries related to sawmills that are considered small and medium sized companies¹⁰².
- § Promotion of association membership and aid to mechanise forestry work
- § Promotion of corporate training.

Initiatives aimed at harvesting and processing

Within the scope of marketing and processing, the most important problems lie in the limited capacity of the forest harvesting companies, their scarce mechanisation, the insecurity of their supplies of raw materials, which are obtained by auction or annual assignment and, on occasions, the lack of transparency of the market.

Mechanisation of forest harvesting work is difficult, due to the steepness of the land and small size of exploitations. Many counties still use animals for the timber hauling off and axes for limbing, as long as debarking occurs in the forest.

The initiatives to improve this sector are as follows:

- § To encourage mechanisation of the forest harvesting companies, which lead to a scarcity of raw materials in the sawmills;
- § To mechanise transport from the felling point till the timber reaches the processing industries, replacing the animal traction in many areas by mechanical traction, to haul timber off and remove to the loading point;
- § To improve debarking conditions with adequate machinery, in order to improve performance and cheapen the cost of debarking
- § To allow efficient elimination of the slash, thus avoiding possible spread of forest fires.

Initiatives aimed at facilitating marketing: forestry certification

The diagnosis has shown that, notwithstanding promotion of competition on the markets, integration of the marketing circuits by monitoring the sustainable origin of the base timber not only contributes to preventing national and international markets being closed, but also allows adjustment of the marketing structures. Monitoring the product throughout its

¹⁰² This consideration is defined in DOCE n° C 213



production cycle, from the original forest until it is sold in finished form as paper, board, furniture, etc., requires adjustment not only of the documentation in the transformation or production processes, but also of the actual processes. Moreover, once a production process is documented for the purposes of certifying traceability of the original product, it is easier to record its defects and thus to improve the quality of the process (ISO 9,000) and its environmental management (ISO 14,000).

Certification of sustainability at origin thus not only favours the management of the original forest (forestry certification is nothing other than monitoring on the market of the product in the managed forest), but also quality improvement in the transformation processes.

Promotion of certification must thus constitute a basic piece, maintaining due neutrality in that no certification system must restrict the rules of competition.

Within the framework provided by the World Trade Organisation and the system of the Convention on International Traffic of Endangered Species (CITES) the requirement of that certification must also be transferred to the overseas policy of the State, in addition to encouraging equitable action by Spanish company owners in importation and evaluation of biological resources in developing countries, in collaboration with the office of the Initiative BIOTRADE of the UNCTAD.

Certification, in general, is defined¹⁰³ by ISO as a process by which an independent third party issues a written certificate that a product, process or service is produced or performed according to specified requisites. Any certification system should provide an equal consideration of the environmental, social and economic aspects. One tends to have forest management standards at national, or even subnational scale, that are compatible with internationally accepted principles and criteria. The basic principles for good forestry certification require a definition of good forest management according to the Conventions and Agreements of Rio and the Conference for Protection of Forests in Europe. To simply declare that timber is from a specific area or geographic origin would cause error, as it does not imply sustainable management.

The full role of forestry certification is to encourage and provide an eco-labelling system with two components:

1. Forestry auditing: inspection of the forestry management, comparing it with specific standards.
2. Assuring a market for the products certified.

The ISO recently developed international standards for environmental declarations, including eco-labels. The aim of eco-labelling is to decrease the stress on the environment

¹⁰³ ISO/EC guide 2 :1991



caused by consumption of products and services (ISO 14020, objective clause 3).

Any credible forestry certification system must fulfil the following two basic objectives:

1. Achieve two main objectives:
 - a. Indirectly improve forest management
 - b. Assure access to the market for the certified products
2. Have compatible national or subnational standards with internationally accepted general principles and criteria
3. Be included within a global working framework that facilitates international recognition and credibility, as well as development of fair regulations that may be applied in the field
4. Assure participation by a wide range of parties concerned
5. Be voluntary
6. Assure evaluation by an independent third party
7. Provide objective standards that may be quantified in the field
8. Be transparent to all the parts involved and for the public in general
9. Assure certification at the level of management unit, being economically profitable and equitable for the small forest owners
10. Assure an active undertaking by the owner/manager of the forest unit certified
11. Be accepted by a large range of the parts involved and credible to the consumers, social organisations and environmental NGOs
12. Be regulated by the market forces

3.2.4.1.2. Cork industry

The main structural problems in cork stands are due to their treatment being abandoned in recent years due to low profitability in recent years, the disappearance of pig grazing (mast) and also the considerable decrease in fuelwood harvesting for charcoal or home-fuel purposes

Due to this, the profitability of cork groves have depended exclusively on the cork and this product, on it own, has not been sufficiently valuable to encourage private owners, who own 92% of the cork stands, to invest in the necessary conservation work and replacement of the trees.

There is a considerable association movement in the cork sector and this is divided into two blocks: the production subsector, and the industrial and commercial subsector.

As far as the processing sector is concerned, most of the preparatory industries are old and badly designed; one may also say that the plug cork industries, above all the small ones (which amount to nearly 70% of the total), have antiquated machinery, above all for the perforation and classification phases.



Preparation of sheet cork, that is to say, boiling, trimming, picking, pressing and bundling, generates an added value of 80%. The second processing of the cork has very variable costs, due to the diversity of products obtained. In manufacturing corks for bottles, which is the main cork product manufactured, the added value is more than 150% the value of the sheet cork.

Initiatives aimed at extraction, processing and marketing

- § Modernisation of the existing installations, which have obsolete machinery making them scarcely competitive, and creation of new milling and grinding industries, to cover the demand of the production.
- § Improvement of the sheet cork preparation facilities and creation of new to replace the more obsolete ones.
- § Increased number of cork preparation facilities in the production zones, and modernisation of the existing ones, with more sophisticated machinery, in order to improve their performance.
- § Installation of bottle cork industries that consume the prepared sheet cork in order to avoid exporting scarcely elaborated cork, as only 20% of the sheet cork is turned into a cork, 80% being left as waste, a raw material for grinding
- § Installation of bottle cork industries that consume sheet cork and cork agglomerate and modernisation of the existing ones, allowing a greater added value in their productions.
- § Increased manufacturing industries that take advantage of by-products that are not fit for bottle corks, which allow reassessment of the raw material value to benefit the producers, as well as modernisation of the existing facilities.
- § Promotion of cork based insulation products, which take advantage of the insulation, fire retardant and great wearing quality of the material, for which low quality crushed cork will be used.

3.2.4.1.3. Aromatic and medicinal plant industry

Due to the geographic location and peculiar ecology of Spain, there is an abundant, varied medicinal and aromatic flora, formed by more than a thousand species and strains, among which there are many endemisms, representing the main species of industrial interest among the European and North African flora.



The companies involved in harvesting, processing and treatment of aromatic and medicinal plants work with very rudimentary equipment, without sufficient technology to obtain quality products and, above all, standardised products, as required by the transformer industries.

New industries must be installed and the existing ones be modernised, in order to be able to treat and process these plants properly, so the action in this sector would consist of installation and modernisation of the aromatic plant treatment and processing industries, to provide a market for the ample production by the sector.

Apart from this, as the biological resource forms part of the biodiversity, its development and protection must be included within the obligations of control on access to these resources imposed by the Convention on Biological Diversity¹⁰⁴. Thus, identification of the forms of action in the private sector and their promotion to generate resources for the communities where such resources have been conserved, must be included in the activities by the working group set up to study control of access and ethical trade of the Spanish biological resources in application of the Spanish Strategy on Conservation and Sustainable Use of the Biological Diversity.

To the extent that, moreover, many of these plants are typical to the arid or semi-arid zones, their promotion would form part of the National Plan of Action against Desertification already described in section 3.2.3.3.

Due to all these factors, a policy to encourage this resource must involve:

- € Research into the chemical composition of the numerous chemotypes there are, as well as the possible standardisation and cultivation of the most interesting species.
- € Dissemination of information on cultivation and marketing of the most appropriate aromatic and medicinal plants through technical files.
- € Installation and modernisation of first processing industries to treat and process aromatic and medicinal plants (industrial dryers and steam distillers), to provide a market for the ample production by the sector.
- € Encouragement of producer association training and promotion of contacts with the industries that use the plants and essential oils.

3.2.4.1.4. Biomass

The diagnosis of the Second Part of the Strategy describes the framework in which the policy is being set for use of such forest products as biomass to produce energy. In order to produce energy from the biomass as yet another forest resource to generate wealth, which is

¹⁰⁴ *Río de Janeiro, 1992*



compatible with other uses, the mechanisms will be established to develop the implement the following strategic initiatives:

- Harvesting of the slash , defining forest areas for energetic purposes, among which there shall be the simultaneous need to act from the forestry point of view and the energy potential. In these cases, the economic resources will be maintained for correct management and improvement of the areas, while simultaneous establishment and fixation of the energy activity will be allowed.
- Planting forest crops with energetic purposes on agricultural land, with grants for reforestation to be performed with EAGGF funds, so there will be an increase in added value due to the set of these activities".

3.2.4.1.5. Non-timber products

a) Resin

The main structural problems of the resin sector arise from the high costs of extraction, the small sized plots of the Spanish resin sector, sudden variations in price, the implementation of new, more productive tapping methods in other countries at a lower cost, while the increase in consumption of substitution products obtained from petroleum, which has caused a drop in the world-wide demand for colophony and turpentine, without a short term increase being foreseeable.

At the end of the sixties, Chinese, Brazilian, Argentinean, Russian and American products flooded the market. This led to a progressive drop in national production, which went from about 40,000 tonnes in 1968 to less than 2,000 in 1991, although as of then there was a slight increase, it now being about 5,000 tonnes.

The future of the sector is still unforeseeable. It seems clear that, under the present circumstances, the slightest improvement in the productivity of this operation would be enormously transcendental.

Initiatives aimed at harvesting, processing and marketing

To achieve in increase in resin production in two possible ways: physical increase of the individual production of each pine tree through genetic improvement, or by developing new extraction methods that lead to greater production from each pine, or in a more favourable relation between the economic profit obtained and the number of hours spent on the activity.



- € Modernisation of the resin pitch processing industries to achieve an increase in production and its diversification to obtain by-products of colophony and turpentine with a place on the market.
- € To encourage the use of distillation systems that obtain high final yields, as well as automation of the processes.
- € Regulation of colophony and turpentine commercialisation, so the price is stabilised and profitability in the sector thus assured.

b) Pine nuts

There are various reasons for interest in this species, among which one must mention:

The growing interest in the fruit of the *Pinus pinea*, which has become the main product and the one of the greatest economic value of most Spanish pine nut forests, due to the increasing demand for the highly appreciated quality pine nuts.

The role of the stone pine site as a natural resource is not limited to its function to generate traditional forest harvestings, which has allowed its persistence and conservation. *Pinus pinea* sites form a fundamental part of the standard environment of the pine bearing counties and are accepted as leisure spots due to their unique landscape value.

The greatest producers nation-wide are Girona and Cordoba. Spain grows a total between 40% and 60% of the world-wide production, depending on the climatic factors and the yield from the species. Almost all the production is exported to Japan, which pays best, and the rest of the production stays in the country to supply the bakery industry.

We can thus see that it is a growing sector with possibilities of increase. Thus, the possible measures to be taken to encourage that sector would be:

- € To have forest reproduction material with the appropriate genetic quality, as the seed is the main method of propagation at present. That measure would allow healthy plantations to be guaranteed, with vigorous growth, as well as an increase in the production.
- € Modernisation of the processing methods of the cones, until obtaining pine nuts, in order to increase its profitability .

c) Mushrooms

Undoubtedly, when the mycological use made of the forest is discussed, special mention must be made of the mycorrhizic species, since these are the main marketing species. On the other hand, the most abundant forest areas depend on such symbiotic associations.



Mycological exploitation may not be considered traditional in the forests as, apart from some exceptions, the mushrooms harvesting began this century. Thus, this is a recently implemented exploitation with medium and long term consequences that are unknown, which has led to a strong demand for information from owners, forest managers, harvesters, conservationists, etc.

Thus, one of the main measures to be adopted to encourage this sector is forestry research aimed at defining the features of the resource, basic rules of harvesting, possibility of improvement, and compatibility with other forest harvestings, among other matters.

On the basis of the results obtained, one must proceed to regulate their exploitation so this is performed in a managed, sustained way.

d) Chestnuts

Chestnut harvesting has an intermediate status, as there are areas where it is grown like any other fruit tree, and areas where it is in the forest and is cared for according to the species and the use intended.

The nation-wide yield is about 20,000 tonnes per annum, with a market price of about 1,700 million pesetas.

Output is usually for direct consumption and pastry baking, although it is also used in fodder.

Production of the species varies widely according to whether it is grown in high or coppice forest, so one of the most urgent measures to be adopted to encourage the industry is to transform the coppice stands suitable for chestnut harvesting into high forests to improve their yield.

As most of the production is obtained from privately owned chestnut groves, another measure to take is to establish grants to conserve the good state of these stands and achieve a better production.

Finally, chestnuts are devastated by such diseases as ink disease (*Phytophthora cinnamoni*) and canker (*Cryphonectria parasitica*), which may even kill the stricken trees. Planning adequate phytosanitary treatments to prevent such diseases is another of the measures that must be taken, requiring supervision by specialist technicians.

3.2.4.2. Promotion of tertiary forest uses



Section 5 of each Diagnosis - Part Two - of this Forestry Strategy describes the growing added value of the tertiary uses and the importance of this to the forestry practice of some Autonomous Communities.

The general objective of encouraging tertiary uses may be broken down into other more specific ones:

- § To evaluate the existing assets. It is necessary to know the existing offer at present, the potential of the different zones, and their ability to attract attention for different uses.
- § To establish the necessary mechanisms to achieve fluid communication between the citizens and planners. The communication must be established in both directions, so the citizens may express their preferences, as well as for them to know the diversity of the existing offer at each moment.
- § To guarantee the sustainability of the natural resource. In two senses: preserving their levels of ecological quality and aesthetic, and maintaining their capacity for social use in the future.
- § To increase the offer for social use. The increased offer refers, on one hand, to the quantitative aspect, and on the other, to its diversification, in different types of areas, as well as the possibilities within each one of these.

Steps to be taken

These are aimed at achieving a specific objective, although they may subsidiary to initiatives set forth in another programme. In any case, all of these contribute synergetically to achieve the general objective.

- € *Map of Spanish Landscapes and Lists of Landscapes of European Interest.* Preparation of a nation-wide cartography of the units of landscape; recording their intrinsic and acquired quality, their fragility and capacity to allow different typos of social activities. This action will be undertaken in co-ordination with the initiatives foreseen in relation to the Spanish Strategy for Conservation and Sustainable Use of the Biological Diversity.
- € *Catalogue of recreational facilities.* Preparation of all points where there are facilities for outdoor recreation, including sports areas only when there are facilities.
- € *Maintenance of the existing facilities.* One way to ensure that demand by zones is not altered is to improve the state of the facilities and allow access to these. One aspect that has a decisive influence on the demand of an area is its state of cleanliness, so special care for that factor must be taken in maintenance.



- € *Inclusion of private land to the recreational offer.* One way to release the pressure on public spaces is to include private land in the recreational offer. The initiative foresees determination as to where such inclusions will be useful (in areas where public land is scarce, in suburban situations under high pressure, etc.) and establishment of compensation for the private owners who join the plan. This initiative also involves an increase in the offer.
- € *Recovery of degraded zones.* Some degraded areas may be recovered for leisure, especially for outdoor sports, which are independent of the environment. The action foresees determination of those areas, their potential demand and, eventually, their effective recovery.
- € *Promotion of interpretation centres.* In zones with special natural values, interpretation centres are an important part of citizens' environmental education, while they are used as a centre for shelter and information (whether upward or downward). The initiative foresees determination of the tasks with sufficient demand to justify the centre and, eventually, it being built.
- € *Recreational information service.* New communication technologies allow the citizens to be reached in an agile, cheap way. The initiative is specified by updating the catalogue of recreational areas and installations and also publishing it on Internet, along with a programme that allows the users to select the recreational facility that suits their particular circumstances best. The system may also record the user preferences.
- € *Inclusion of new recreational activities in the existing areas.* Recreational areas have a life cycle that begins with discovery, continues with intensive use and ends in disuse. The initiative consists of studying the capacity of the existing areas to receive new activities that allow their recreational offer to be diversified and the necessary adaptation to be performed afterward. The aim is thus to diversify the offer, as well as to enable new areas to be created, providing an increase in net offer.
- € *New facilities.* As the demand is still growing, it seems necessary to continue to increase the number of facilities available. The emphasis must be placed on those that aid development of rural tourism (paths, livestock tracks) and those that may contribute (alternative destinations) to release the pressure on areas which are already overloaded (suburban areas and protected zones).
- € *Regulate the use of off-road vehicles in forests,* making clear and supervising which paths and tracks (and only these) may be used to practice this kind of sport/excursion.

All of these competencies shall be assigned to the Autonomous Communities, notwithstanding those of the National Government related to co-ordination with international bodies. Spain will ratify the European Landscape Convention, the draft project of which was approved by the Assembly of Local and Regional Powers of Europe at Strasbourg in May 1998, so the Basic Act on Forests and Forest Harvesting would be limited to consecrating this social function in its text and to creating, if necessary, its status as Law, the necessary



international forums to articulate collaboration between the National and Autonomous Communities.

The Programme eventually articulated to assess the Natura 2000 Network according to the Spanish Conservation and Sustainable Use Strategy for the Biological Diversity will have recreational use (as long as this does not exceed the load capacity) as one of those that will provide resources to the socio-economic environments of the zones in the Network (SBPAs and LIC protected zones) and must be aimed at maximising these resources and redistribution of the revenue among the local populations.

As to game hunting and river fishing, the value of which nowadays is already close to tertiary - recreational - uses of the forest, the initiatives to be undertaken shall be agreed within the forum, recently created by the Industry Conference for the Environment of 1 December 1998, of the Inter-Regional Hunting and River Fishing Observatory.

The Autonomous Communities and the permanent observers - the Hunting and Fishing Federations, Aproca, etc. - should use this inter-regional forum to decide on the most appropriate measures for sustainable development of both sectors.

3.2.4.3. Recovery of rural areas

The unique initiatives in dehesas, alpine areas and livestock tracks will also contribute to complete articulation of the forest policies. The problems of degradation of rural space previously mentioned become more severe in these traditional ecosystems, which are the result of a balance between Nature and the rural population, and which are based on extensive use of the land.

3.2.4.3.1. Dehesas, grazing forests and other formations with forestry-farming uses

The southern half of Spain has long periods of drought in summer and severe exposure to the sun. Under such circumstances, the presence of trees is fundamental to allow the grass to grow, as the shade from the trees prevents the upper soil horizon reaching high temperatures, lowering transpiration by the vegetation and prolonging the growing period. On the other hand, perennial trees prevent the ground from becoming too cold and allow greater growth of grass during the winter.

Spanish dehesas have generally been formed in valley or table land zones by the clearing of holm and cork oak stands, which have provided food for livestock, acorns, in the seasons when grass is scarce. This category may also include the most open stone pine and ash stands. These grazing forests are of great use to man and provide a comfortable area where the livestock may survive the high summer temperatures in the shade of the trees. Great precaution must be taken to maintain these, so their ground is not invaded by shrubs, mainly those of the rockrose and thorn type.



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The social outcry over the scarce profitability of these dehesas, a millenary farming-grazing-forestry system, with its high ecological value, requires the urgent preparation of a plan in co-ordination with the Ministry of Agriculture Fishery and Food, to permit their conservation and improvement, as well as assigning part of them to the rural use development programme.

As grazing forests are specially suited exploitations to the inherent features of Western Spain, they deserve to be given adequate attention, aimed at improving the trees, ensuring they are more fruitful, without forgetting the importance of the use made of the herbaceous stratum. Conservation and improvement of grassland must become an obligatory point in the working plans made for these forests.

In order to improve grasslands in the dehesas as well as all the general areas of forest assigned to such use, three aspects must be taken into account:

- š Improvement of the pasture itself by uprooting shrubs and undesired species, artificial propagation of the adequate species where necessary, clearing up the waterlogged parts, collection of stones, fertilisation, irrigation, etc.
- š Improvements aimed at facilitating grazing, increasing the grassland value by opening up transit pathways to allow the livestock to reach the different areas of the forest without tiring and without trampling on the pasture which is being regenerated, installation of livestock reservoirs, fountains, pens and shelter yards for the livestock.
- š Improvements in the grazing methods, ensuring the kind of livestock is the most appropriate in each case, and that the total number of heads never exceeds that which may be duly sustained by feeding on the pasture without damaging it.

However, in addition to encouraging these structures, all their yields must be covered from an integral point of view, including the cultural factors. This initiative must be extended to all these formations, although they are not traditionally classified as dehesas, inherent to some regions of Spain, such as, for example, promotion of integral initiatives to support the chestnut coppices in the Autonomous Regions of Galicia, Asturias and Castilla y León, among others, which to a great extent are comparable to the Mediterranean dehesas.

As the competencies on crop and livestock farming in the dehesas belong to the Ministry of Agriculture Fishery and Food, this Department and the Ministry of Environment, together with the Autonomous Communities, must prepare a Spanish Dehesa Plan to unify and provide coherence to the initiatives by all the Authorities. One may even think of



maintaining a Research and Development Centre for such a widespread and valuable ecosystem from the cultural point of view and for the biological diversity of Spain.

This Plan should be formed by initiatives already undertaken jointly with Portugal within the framework of Appendix IV of the Convention to Combat Desertification.

3.2.4.3.2. Mountain Agriculture Zones

The situation of mountain agricultural zones is very similar, as they have been progressively abandoned. Identification of the areas in which the European Union policy is attempting to establish the population, to study to what extent forestry management is feasible, may provide an alternative to avoid their degradation.

This management must not be limited to tree cover, timber yielding or protection forests, but major attention must be paid to mountain pastures, whose seasonal use provides a very important supplementary income for the target populations expected to be stabilised.

The Ministry of Environment should collaborate more intensely with the Ministry of Agriculture Fishery and Food and other Departments and Autonomous Communities to encourage initiatives and programmes that contribute to generating revenue in these zones, in fulfilment of the terms of article 130.2 of the Constitution.

3.2.4.3.3. Livestock tracks

In spite of their abandonment in recent years, livestock tracks are still used by part of the national livestock, whether by seasonal or final transhumance under extensive local regime (a total of 700,000 sheep and 100,000 cattle). Moreover, they represent the traditional routes into the mountain pastures and the winter dehesas.

However, the initiatives within this framework already have the recent solidity provided by the framework of competencies, which is perfectly defined by Act 3/1995, of 23 March, on Livestock tracks, so the necessary initiatives will have to be specified through resolutions by the Council of Ministers on grants and subventions.

This same scheme, to be decided by the meeting of the Industry Conference and submitted to the Council of Ministers, must be used to aid dehesas and alpine zones based on biodiversity and/or forestry subprogrammes.

3.3. ENVIRONMENTAL EDUCATION

Society's overall perception of forests has a considerable effect on future projection of the actual Strategy. It is therefore advisable to establish the priority objectives and lines of



action that contribute to better knowledge and evaluation of the forests, of the resources extracted from them and of overall dependence on them.

The aim must not only be to learn and implement knowledge and experiences, but also to seek social involvement at all times by generating coherent activities and skills for the aims set forth in the document.

Making the forests familiar as a basic natural system for life, which is lasting and sustainable, is one of the fundamental priorities.

The set of objectives inspiring the approach to environmental education must be to:

- § Foster awareness of the forests, our relation with them, and their multifunctionality.
- § Facilitate the interrelation between water, earth, air and the forest.
- § Make forestry techniques of sustainable management that encourage conservation and improvement understandable. To link the word "Resources" to forests.
- § Generate appropriate knowledge of Spanish forestry techniques in relation to ownership, economic value, the biological diversity it contains and its present dilemmas.
- § Generate global awareness that relates the concept of sustainable development to forests.
- § Encourage knowledge of the qualities of forest products as natural, renewable, recoverable raw materials, that are compatible with the environment.

In order to fulfil these objectives, it will be necessary to develop diverse programmes that clearly establish aspects of methodology and the overall ones the initiatives are aimed at.

Bearing the target population in mind, the main lines of action and priorities shown in the diverse chapters of the forestry strategy and specification of an Environmental Education programme must consider the following aspects:

Education system

The initiatives aimed at the educational system overall must seek integration within the existing programmes and establish more dynamic specific Environmental Education programmes for the different levels of training, in the task of creating materials and teaching guides, as well as in trainer training on these aspects.



In this sense, four generic levels of development must be established, coinciding with the overall division of Kindergarten, Primary, Secondary and High School, Universities, or equivalent.

The main task set must be to foster knowledge and learning of the elements that form the forest, their operation, the relation we have with them and their coherent management to achieve sustainable development that guarantees their conservation, improvement and delivery to the generations to come.

We must encourage relations between the institutions responsible for educating trainers and application of new programmes with others of environmental responsibility in forestry matters, to co-ordinate efforts and optimise the resources used.

Diverse social groups

In order to favour greater comprehension and improve establishment of adequate codes of conduct among the diverse groups that articulate Spanish society, diverse initiatives should be established, aimed at involving and affecting interest groups related to the Strategy.

To achieve this, the creation of basic information and communication systems should be established in relation to forests, in order to develop:

- § Features and list of the Spanish Forests
- § Rules for use and enjoyment
- § Inventory of zones assigned to leisure and recreation
- § Lists of diverse forestry professions
- § Information on Institutions responsible for forestry management
- § Establishment and promotion of training plans concerning the reality of Spanish forestry for of the sectors involved, considering the priorities established in the Strategy
- § Favouring and dissemination of identification of divagation and awareness initiatives related to the Forest.

The National environmental education plan which is being prepared by the Ministry of Environment will also contain a specific industry plan aimed at the forestry sector.



PART THREE: APPLICATION AND MONITORING OF THE SPANISH FORESTRY STRATEGY

The Forestry Strategy must set its own timeframe, so as to be sufficiently flexible to correct the errors that come to light as its implementation begins.

The Spanish Forestry Strategy aims include the main references to solving the major problems and satisfying the needs to achieve the best, most appropriate management of the Spanish forestry ecosystems, according to their particular features, which are already recognised in diverse fields and forums at the international, European and Spanish levels. The basic, explicit objectives of that strategy must be as follows:

- § Protection and improvement of the vegetation cover and restoration of the degraded forest ecosystems, according to their social, economic and ecological functions.
- § Support for development and application of sustainable forestry management models. That is, organisation of their use, according to their social, economic and ecological functions, in order to ensure compatible use of resources and their conservation, guaranteeing their persistence in adequate quantities and quality for the generations to come.
- § Adaptation of Spanish forest policy to the demands of the different Spanish forest ecosystems in the different biogeographic regions and diverse circumstances, encouraging the most adequate management model in each case, as well as co-ordinating and supporting the initiatives and strategies by the Autonomous Communities to that end.
- § The closest possible co-ordination between National and Regional Government forestry policies in order to concentrate and direct the efforts to achieve sustainable use of the forest resources according to their potentials.
- § Fulfilment, according to the specific features and functions of the Spanish forest ecosystems, of the international and European objectives and criteria adopted on forestry matters, as well as



ensuring these consider the features and unique nature of the Spanish forest ecosystems, particularly Mediterranean forests, due to their uniquely important role in Spain, Mediterranean Europe and the Mediterranean basin.

- § According to the general objectives of the Strategy and plans or strategies of the Autonomous Communities, and the characteristics of the forest ecosystems in the area and particular circumstances, it is necessary to support and encourage private Forest Activity to also favour rural economic diversification and job creation, according to the principles of multifunctionality and sustainability.

The Spanish Forestry Strategy thus considers a series of objectives for proposals for action to apply these. Such a long-term strategy as this one must include the methods and periods for checking and monitoring, in order to produce feedback allowing correction of the deviations that arise. In order to do so, the available statistical indicators will be used, and those foreseen for application in the future.

In spite of the Forestry Strategy having to act over extremely long periods due to the very nature of its objectives, monitoring and a review every 10 years should permit an assessment of the extent of its application and the need to adapt to the changes and trends that may arise in due time, through the delegate body of the Industry Conference. This monitoring should be embodied in a provisional report when half the foreseen term elapses, and a definitive one when that term ends and, based on this, the actual Industry Conference, following a report by the Forestry High Council, National Forestry Council, or similar, shall be in charge of proposing the amendments deemed fit.

The criteria applied to sustainable management of our forests, the main objective of the Strategy, are those approved and signed by Spain at the 3rd Ministerial Conference on Forest Protection in Lisbon (June 1998). These criteria are assessed through the indicators considered by the evaluation body to be most appropriate to determine whether Spanish forests meet the requirements, the choice being understood as a dynamic process under continual improvement, considering the necessary comparative conditions. To this end, the Experimental Network to Improve Sustainable Management this Strategy considers must have a fundamental role in determining the most ideal indicators for its own evaluation.



APPENDIX I: THE SPANISH FORESTRY STRATEGY AND THE STRATEGY FOR THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY

Any analysis of the relationship between biodiversity and forests should be based on the premise that forests are responsible for the source, the evolution and the maintenance of a large part of the biodiversity on our planet. This is stressed in most of the official texts produced by the Intergovernmental Forests Panel, the documents relating to the European Union Forestry strategy and the Resolutions from the Conference of Parties to the Biodiversity Convention subscribed by Spain and in the Spanish Strategy for Biodiversity Conservation and Sustainable Use (SSBC), which is closely linked to this Forestry strategy. Several sections of the SSBC refer to the interactions between biodiversity and the forestry industry, including summarised contributions from different perspectives.

Common Objectives

The ultimate objective of the SSBC with regard to the forest environment has been defined as *The conservation and sustainable use of biodiversity, in its different strata of population, species and genes, currently and potentially contained in the different Spanish forest ecosystems, taking into consideration their different states of development*. This objective is part of a guaranteed level of sustainability being sought for Spanish forests, as set out in this Forestry strategy.

Many of the partial objectives of the SSBC also coincide with those of the Forestry strategy:

- § Guarantees for a total and ecologically appropriate representation of Spanish forest systems, including their different stages of development in each of the networks of protected natural areas
- § Adoption of biodiversity conservation and sustainable use as a criteria for forest management in the areas subject to planning and management, regardless of their type of protection
- § Inclusion of conservation and sustainable use of forest biodiversity in sector policies linked directly or indirectly to the forest industry.
- § Restoration of degraded forest systems, returning them to the highest feasible natural state as a functionally ecological criterion,



or to guarantee the broadest possible range of potential uses in areas under intensive use.

Both documents thus inevitably try to steer government policies in the same direction, given that **biodiversity and its maintenance are an integral part of the concept of sustainable forest management as defined by the** Ministerial Conference on Forest Protection in Europe, signed by Spain and to a large degree the inspiration for this Forestry strategy.

2. Common actions

The SSBC lists a series of measures that should be applied to the forestry industry with a view to fulfilling these objectives:

- ∕ Use of conservation and sustainable usage of the components of forest biodiversity as a criterion in forest planning and management.
- ∕ Inclusion of the largest possible number of components of the biodiversity of these ecosystems in forest management.
- ∕ Development and practical application of forest management patterns that respect the biological quality of the environment and enable its biodiversity to be maintained at an optimum level.
- ∕ Regulation and encouragement of traditional practices that enhance compatibility with biodiversity conservation and sustainable use.
- ∕ Inclusion of the concept of multiple function and use in the planning and management of each type of forest or tree stand.
- ∕ Restrictions on the introduction and expansion of inappropriate species which endanger ecosystems, habitats, species or adapted populations.
- ∕ Provision of a protection system for the source areas of forest ecotypes.
- ∕ Access control and guarantees of ethical trade and equitable return for biological forest resources.
- ∕ Articulation of a consistent policy of landscapes maps and lists.
- ∕ Articulation of a promotion plan for *dehesas*.
- ∕ Analysis of compatibility between forest management practices and demands arising from the inclusion of a zone in the Natura 2000 Network.
- ∕ Recovery and protection of traditional knowledge of medicinal and aromatic plants and shrubs and forestry-agricultural-grazing management practices.



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- ∕ Articulation of environmental impact assessment measures in the terms envisaged in both Strategies
- ∕ Safeguards for the pre-eminence of wetland conservation under the terms envisaged in the forthcoming Protection Plan for Aquatic and Wetland Ecosystems.
- ∕ Application of the CITES system to wood and forest products where necessary.
- ∕ Involvement of forest land owners in the conservation and sustainable harvesting of their forest resources.
- ∕ Promotion of knowledge and value-adding to the components of forest biodiversity amongst the rural population as elements of their own culture.
- ∕ Promotion of participation by social forest organizations in the design, management and application of dissemination and publicity programmes for forest preservation and sustainable use.
- ∕ Encouragement of environmental education programmes, especially in the areas of influence of protected zones in order to raise local awareness of the importance of maintaining the biodiversity of their forest ecosystems.

Although some are formulated in different ways, these measures coincide conceptually with the range of actions proposed by the Forestry strategy, given that this is a sectorial Strategy while the SSBC has a cross-sector focus and thus affects a wider range of specific sectorial policies.

Bearing in mind that the majority of Spain's biodiversity is found in forest areas, both strategies must complement each other and be applied simultaneously in the nation's forests.



APPENDIX II: THE SPANISH FORESTRY STRATEGY AND THE WHITE PAPER ON WATER

The Spanish White Paper on Water insists on the need for consistency between three of the sector plans discussed in this Strategy and the National Water Plan: The Water-Forest Restoration Plan, the National Action Plan on Desertification and the Water and Wetlands Ecosystem Plan.

The first Plan is most closely related to the national water policy. Co-ordination between the governmental units arising from the former Hydrological–Forest Division under a body that acts jointly with the River Basin Management Confederations is an indispensable requirement for rationalised governmental action. This type of co-ordination probably requires an additional effort, bearing in mind the traditional lack of co-ordination in the distribution of human and budgetary resources across several independent departments. The present Confederations lack the appropriate staff and know-how for the hydrological/forest restoration projects, currently the responsibility of the Autonomous Communities, the Sub-Directorate-General for Forest Policy under the Directorate-General of Nature Conservation and the national public companies responsible for the implementation of numerous projects. However, real efficiency in the infrastructure of hydrological-forest restoration work must not under any circumstances be considered unrelated to the core functions that should be managed by the River Confederations. Together with the importance of these initiatives for much broader areas than just the river basins, this type of co-ordination inevitably makes participation by the Autonomous Communities not only highly recommendable but also constitutionally necessary.

All of the above-mentioned levels of Government are thus responsible for the design of the whole package of projects that make up the Water-Forest Restoration Plan.

The joint design and management of the Plan is also necessary to gain access to one of the funding sources that should place a high-priority focus on these projects: the European Union Cohesion Fund. (See Appendix V).

The National Action Programme Against Desertification includes initiatives aimed at maximising irrigated lands efficiency and water saving, the exploration of value-added biological technologies for water and wetlands with extremely high levels of salinity, as well as the measures described in Section 3.2.



Finally, many of Spain's wetlands are considered to lie in wasteland. These are the focus of a specific sectorial development plan under the Spanish Strategy for Biodiversity Conservation and Sustainable Use, which is also considered to be a fundamental part of future hydrological plans. They are also included in the forest legislation in some of Spain's Autonomous Communitys to the extent that the land element predominates over water.



APPENDIX III: SPANISH FOREST LEGISLATION

1. NATIONAL FOREST LEGISLATION IN FORCE

- § Spanish Constitution of 27 December 1978 (Government Gazette n° 311-1 29-12-78): art. 148 & 149.
- § Penal Code. Organic Act 10/1995 of 23 November (Government Gazette n° 281, 24-11-1995): art. 330 to 340.
- § Forest Act 8 June 1957 (Government Gazette n° 151 10-6-1957).
- § Decree 485/1962 of 22 February, which enacted the Forest Regulation (Gazette 61 & 62 12 and 13 March 1962).
- § Decree 2661/1967 on distances of forest plantations
- § Act 81/1968 of 6 December on forest fires (Government Gazette n° 294, 7-12-1968). This Act repeals Art. 70 to 75 both under the Forest Act of 8-6-1957 and those concordant with its Regulation, as well as Act of 3-12-1953 with respect to the forest fire hazard. Art. 4-3 of the Forest Act is repealed by Act 52/1968 of 27 July on communally owned neighbourhood forests, repealed by Act 55/1980 of 11 November. The Act referenced by Art. 5-2 is repealed by Act 12-1-1973 on agricultural reform and development. The Act mentioned in Art. 36 of the Forest Act, was repealed by Agricultural Reform and Development Act of 12-1-1973. Art. 38.5 of the Forest Act is repealed by the Water Act 29/1985 of 2 August.
- § Act 22/1992 on free plantations on land in the C.U.P.
- § Royal Decree 1538/ 1996 of 21 June, on responsibility for nature conservation and National Parks under the Ministry of Environment (Government Gazette n° 153 of 25 June 1996).
- § Royal Decree 1894/1996 of 2 August, on the Organic Structure of the Ministry of Environment (Government Gazette n° 189, of 6-8-1996).
- § Act 4/1989 of 27 March on the Conservation of Natural Areas and Wildlife (Government Gazette n° 74 de 28-3-1989). This Act has



been modified by Acts n° 40 and 41 of 5-11-1997 (Government Gazette n° 266 of 6 November).

- § Act 5/1977 of 4 January on Promotion of Forestry Production (Government Gazette n° 7 of 8-1-1977).
- § Royal Decree 152/1996 of 2 February, on subsidies to promote forestry investment on farmland and development and usage initiatives in rural forests. (Government Gazette n° 45 of 21-2-1996).
- § Act 55/1980 of 11 November on commonly owned municipal forests. (Government Gazette n° 280 of 21-11-1980).
- § Act 52/1982 of 30 June on Mountain Agriculture. (Government Gazette n° 164 of 10-7-1982).
- § Act 3/1995 of 23 March on Livestock Routes (*cañadas*) (Government Gazette n° 71 of 24-3-1995).

2. AUTONOMIC FOREST LEGISLATION IN FORCE

ANDALUCIA

- § Andalusian Forest Act 2/1992 of 15 June (B.O.J.A. n° 57 of 23 June 1992; Government Gazette n° 163 of 8 July)
- § Decree n° 208/1997 of 9 September. Forestry Regulation (B.O.J.A. n° 117 of 7 October 1997).

CATALONIA

- § Catalonia Forest Act 6/1988 of 30 March, (D.O.G.C. n° 978 of 15-4-1988; Government Gazette n° 105 of 2-5-1988).

CASTILLA-LA MANCHA

- § Act 2/1988 of 31 May on Land Conservation and Protection of Natural Vegetation Cover. (D.O.C.M. n° 26 of 28-6-1988).

§



EXTREMADURA

- š Dehesa Act 1/1986 of 2 May (C.O.E. n° 40 of 15 May 1986)

GALICIA

- š Communally Owned Municipal Forests Act 13/1989 of 10 October

MADRID

- š Forest Protection Act 16/1995 of 4 May, (B.O.C.M. n° 127 of 30-5-1995; Government Gazette n° 190 of 10 August).

NAVARRA

- š Act Regional Government Act 13/1990 of 31 December on Protection and Development of the Navarra Forest Heritage. (B.O.N. n° 6 of 14-1-1991; Government Gazette n° 70 of 22 March).
- š Decree n° 59/1992 of 17-2-1992. Forestry Regulation (B.O.N. n° 48 de 20-4-1992).

LA RIOJA

- š Act 2/1995 of 10 February on the Protection and Development of the La Rioja Forest Heritage. (B.O.R. n° 22 of 21-2-1995; Government Gazette N° 63 of 15 March).

BASQUE COUNTRY

- š Regulation of 13 August 1986 on Forests in the Historical Territories of Alava
- š Regulation 6/1994 of 8 July on Forests of Guipúzcoa



- § Regulation 3/94 of 2 June on Forests and Administration of Protected Natural Areas, Vizcaya

VALENCIA

- § Forest Act 3/1993 of 9 December, Regional Government of Valencia. (B.O.G.V. n° 2168 of 21-12-1993; Government Gazette n° 23 of 27-1-1994).
- § Decree n° 98/1995 of 16-5-1995. Forest Regulation (D.O.G.V. n° 2520 of 1-6-1995).

3. REPEALED LEGISLATION

€ Under the Forest Act now in force, the following legislation is repealed:

- § Forest Act of 24-5-1863;
- § Act of 11-7-1877 on Public Forest Improvement, Promotion Plantation;
- § Act on Forest Conservation & Plantation of 24-6-1980;
- § National Parks Act of 7-12-1916;
- § Act of 16-7-1949 on Harvestings and Improvement of non-managed Forests;
- § Act of 7-4-1952 on Assistance for forest reforestation;
- § Act of 22-12-1955 on Grants to private Individuals
- § Act of 12-5-1956 referring to Forest plagues.
- § Act of 4-6-1940, on timber supply, except for Articles 1, 2, 3, 5 & 10, still in force,
- § Act on Defence against Forest Plagues of 20-12-1952, except Articles 1, 2, 3, 4 & 9 still in force.
- § National Forest Heritage Act of 10-3-1941 (Government Gazette n° 100 of 10-4-1941), partially repealed by Decree Act 17/1971 of 28 October, deleting PFE (functions taken over by ICONA).
- § Act 15/1975 of 2 May on Protected Natural Areas, repealed by Act 4/1989 of 27 March on Nature and Wildlife Conservation.
- § Royal Decree 378/1993 of 12 March, on tree plantation subsidies on farmland and rural areas, modified under Royal Decree 2086/1994 of 20 October, repealed by Royal Decree 152/1996 of 2 February, which establishes tree plantation subsidies on



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farmland and rural areas and assistance for forest development and usage in rural areas.

§ Act nº 52/1968 of 27 July on Commonly owned local forests, repealed by Act 55/1980 of 11 November.



APPENDIX IV: JOBS AND TRAINING

The Decision by the Economic and Social Committee of the European Union entitled Situation and Problems of Silviculture in the European Union and Development Potential of Forest Policies states that **unemployment is a serious problem in Europe which affects millions of people. The lack of employment is particularly serious in the harshest months of the year in towns that live from forest resources, where uncontrolled sub-employment has reached alarming proportions.**

In this context, the forestry industry is a particularly important source of welfare. It is a sector that requires a large labour force and creates many jobs: basic forest management and wood handling in the forests by operators, both owners and employees, are qualified skills. However, the shortage of specialised workers has become noticeable in recent years due to the underexploitation of their potential and the abandonment of year-round silviculture work.

Following on from the Edinburgh Summit, the Member States of the Union have designed National Employment Plans that are expected to embrace all policies working towards this goal. One of the 17 activities included in the Spanish Plan is the *protection and maintenance of natural areas*. Analytical studies have revealed three types of jobs generated as a result of the protection and maintenance of natural areas:

- ∄ New highly qualified professions
- ∄ Jobs linked to maintenance
- ∄ Jobs resulting from the policy of conversion and multifunctional usage in agriculture and fishing.

Most of the jobs created in these areas are medium to long-term positions. The National Employment Institute (INEM) was created to help people find work and companies to find the appropriate staff for their needs, as well as to encourage worker training as means to improve their job prospects. For this purpose, and in the framework of the job creation policy designed by the Government, the INEM provides a range of grants and subsidies aimed at encouraging and sponsoring the employment of certain pools of unemployed workers, as well as improving their level of training and qualifications. The INEM generally does not act directly. Instead, the actual contracting or training operation is the responsibility of the bodies which are subsidised for this purpose.



While Spain currently has a total of some 2 million small forest owners¹⁰⁵ and hundreds of thousands of workers depend on the Spanish forestry industry, even more jobs could be created if more attention were paid to the activity of small businesses that are linked to forest management, recreation activities and tourism- examples of what is known as *job reservoirs*.

In the light of these observations and as a contribution to the development and promotion of the socio-labor aspects of the forestry industry, this Strategy proposes that planning and development steps should be by taken by the national government in collaboration with the Autonomous Communities and the representative social agents (trades unions etc.) to draft a **Training and Job Creation Plan** in the forest sectors as a focal point for an increase in the potential level of employment in these areas. This Plan should be put into practice within a year of the enactment of the Forestry strategy, and should include a timetable of activities, a financial commitment for their implementation and a mechanism for monitoring and participation by all of the agents involved- National and Autonomous Communities, trades unions and business organisations.

On the basis of the analysis of the labour and training situation in the forest and forestry sector, this Plan must help to identify and exploit any new potential sources of work to be found in the sectors, and describe the training measures that may encourage both skill acquisition by unemployed persons in the new areas of work and also professional retraining for those who may be unemployed in the area. It should also include and co-ordinate job promotion and training initiatives which are currently undertaken by the INEM. The following list includes some of these initiatives which coincide most closely with the aims of this Plan:

- € Workshop and Trades Schools Programme.
- € New Job Workshop Programme.
- € National Job Training and Placement Plan.
- € INEM subsidies in collaboration with national, regional and local government bodies, universities, and other non-profit institutions aimed at promoting contracts for unemployed persons to undertake works and services of a general and social interest.
- € Subsidies and grants for local job initiatives and contracts for local development and labour agents as a point for reactivating job creation at a local and county level.
- € Seasonal social assistance work.
- € Payment of unemployment subsidies in a lump sum for their current value as a means of job promotion.

¹⁰⁵ 12 million in the European Union



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The activities covered by this Plan could be included in the area of on-going job training or employed workers. For this purpose, the legal framework could be the II National Agreement on On-going Training, signed on 19 December 1996 by the National Government, the Employers' Federation (CEOE), the Small Business Federation (CEPYME) and the trades unions UGT, CC.OO and CIG, published as a Resolution of 14 January 1997 by the Directorate-General of Employment and Migration, and the Three-party Agreement on On-going Training, signed on the same date with the Ministry of Labour and Social Affairs, and published in a Resolution of 28 April 1997 by the Department Undersecretariat.

Funding for job training should be the responsibility of the INEM, while on-going training should be covered by FORCEM.

The Plan should also have its own timetable, a monitoring mechanism with participatory bodies involving the relevant social agents and indicative criteria to assess and if necessary modify the regulated professions that require higher training qualifications.

The requirements of the forest sector make it necessary for the Government bodies with responsibilities in the area to manage the issues in a decisive, efficient and co-ordinated manner so as to avoid repetitive or uncoordinated initiatives and unfortunate omissions. The Plan should therefore become a reference framework for the integration of programmes and initiatives by the other public bodies with responsibilities in these matters, so that it may act as a co-ordinating mechanism for the initiatives in this field. A further objective should be to ensure the rational use of the support measures for job contracting and promotion.

Having appreciated the need for such a Plan, the INEM, the Ministry of Environment and the Spanish Federation of Municipalities and Provinces have signed a framework agreement to encourage young people under 25 to gain professional qualifications, upgrade rural towns and environments, and recover traditional and handcraft trades that may prove to be a source of job creation, all of which have a considerable influence on the forest sector.

In order to improve the structure of the sector as a labour category, the task of creating an inventory of the professional categories and jobs should move beyond the present inventory which only covers the forestry industry as such. Instead, there should be further cross-comparison inventories in order to define the jobs which have a larger deficit in human resources and the points where real potential job reservoirs may exist.

All of these initiatives will undoubtedly help to organise and structure the forest sector. Under no circumstances must they overlook the large numbers of freelance or independent professional and members of neighbourhood communities and co-operatives. Associated work undertaken through forest co-operatives plays an important part in stabilising the population in rural areas, generally in areas with a high unemployment rate, and they should be stimulated under this Plan as part of the training for professional skills amongst forestry workers as described in Appendix V. In the case of salary-earning professionals, negotiation units should be encouraged with a view to reaching similar labour

agreements to those applied to labour conditions for farm workers.

Finally, as discussed elsewhere in this Strategy, the standardisation of safety regulations in the forestry industry is highly recommendable.



APPENDIX V: FORESTRY PROFESSIONS

Due to the principle of multifunctionality and the interdisciplinary nature of every action related to territorial planning, management and nature conservation, the planning and supervision of Spanish forests is not nor should be classified as a single profession, a labour category or an area of knowledge. All of them include perspectives and methodologies that are highly useful for ensuring the effective application of this Strategy.

Ever since the establishment of the government organisation known as *Montes a cargo de la Marina* (Forested areas managed by the Navy), however, there have been unregulated work categories, along with regulated professions and groups whose primary role has been intimately linked to forest preservation, management, and care.

Appendix IV on training and job creation describes the process required for a complete inventory of non-regulated job categories with a view to rationalising qualifications. This sectorial initiative serves as a guide for the steps that should be taken.

Amongst the officially recognised qualifications, the schools and corps of Forestry Engineers, and Forest Rangers were established in the second half of the 19th century. These groups are the living expression of the complexity of the multidisciplinary and multi-purpose functions involved in these professions. Their work has always been appreciated and desired by the rural population. There has only been one notable exception to this public appreciation. In 1876, King Alfonso XII dismissed the forest rangers service and entrusted their work to the Civil Guards, a decision which was partially repealed soon after when the District Forest Crop Foremen were entrusted with reporting on any damage to the country's forests, and a few years later when the National Forest Rangers Service was created.

Forest Rangers Service

The role of National Forest Rangers is still officially defined by Decree 2481/1966 of 10 September, the core contents of which was taken from the text of 31 December 1941 and partially reformed in 1953, although in practice it is almost impossible to apply. While the Forest Guard functions were expanded by Royal Decree 2711/1982 of 24 September and the Public Service Reform Act 30/1984 did not eliminate the body, it was assigned to the Ministry for Agriculture, Fisheries and Food in the Resolution of the Council of Ministers on 21 December 1984, and then to the Ministry of Environment in the Resolution of the Public Service Ministry of 28 October 1997, in practice other bodies and staff categories have arisen in the meantime. Together with the political decentralisation process which devolved responsibilities for forest management to the Autonomous Communities and the revised regulations governing the national security bodies in 1986, these steps have left the role of the Forest Rangers delegated to the civil servants employed by the National Parks Body.



The National Institute for Nature Conservation (ICONA) established the ranks of the Forest Rangers, which also had its functions expanded by Royal Decree 2711/1982 and survived the 21 December 1984 Resolution of the Council of Ministers). After 1989, ICONA also consolidated the practice of contracting staff to conduct watch work, now known officially as National Park Rangers.

The Autonomous Communities have adopted a wide range of policies with the corresponding legislation. Forest Rangers are still a corps of civil servants in some Autonomous Communities while in others (e.g., Canary Islands) they have become part of a broader environmental police force. The ranks have disappeared in some cases, and in others they have become auxiliary administrative corps or “forest agents”. One aspect which has been eliminated, however, is the possibility of the establishment of a single national body, as this option, taken in certain exceptional circumstances, has not been taken up in this case. The Autonomous Communities have full responsibilities for the organisation and regulation of forest officers, and there is no possibility whatsoever of creating common linked patterns in the same manner as certain other national forces.

Forest Rangers are not mentioned in the National Security Forces Act of 1986, nor is there an equivalent regulation to the one for the Private Rural Guards established under Royal Decrees 137/1993 of 29 January, 2364/1994 of 9 December and the Ministerial Orders of 15 February 1997 and 30 April 1998 on arms control. This is the reason for recent doubts about whether Forest Rangers are in fact agents of the national authorities and whether and to what extent they have the right to carry firearms. As the later issue is not an exclusive responsibility of the Autonomous Communities, the confusion has extended to the Regional level.

Proposals for initiatives should therefore involve a clarification of the situation:

- š A national parliament Bill, Royal Decree or some other regulation under the Interior Ministry, should define the link with the functions of the national security forces, as well as the levels and professional categories for the purpose of clarifying the use of firearms. If the forest Rangers are defined as civil servants with the right to use administrative force, there is no sense in their use of firearms being regulated as if they were private gamekeepers.
- š The situation of the national civil servants and employees is an internal matter for the Ministry of Environment, which shall pass or propose the necessary steps within the framework of its staffing policy.
- š The Autonomous Communities will have full staff management powers and organise their structure as they see fit, with the exception of the areas discussed in Section 1, including the power



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to create environmental policing bodies, rural or forest Rangers, etc., and the right to use force as an agent of authority.

- § This should not be an obstacle to associations of forest professions being promoted by the national government under a support policy for the restructured sector, and as a consequence of the need, corroborated by both the National and Autonomous Communities, for on-going improvements in the professionalisation of all those working in forest conservation. This also involves the promotion of training and skill-gathering initiatives by trades unions and forestry entrepreneurs, as well as the improvement of the living conditions of forest workers. A special line of subsidies should be made available to support such initiatives without this affecting the participation by all of these interest groups in the activities discussed in Appendix IV.



Forestry

The professionals in the National Technical Forest Engineers Corps are governed by the Special Corps of Forest Assistants Regulation passed by Decree 2480/1966 of 10 September, an adaptation of Decree 4150/1964 of 23 December which approved the Articulated National Civil Servants Act and the previous Regulation passed by the Decree of 22 June 1956. The Regulation for the Special Corps of Forest Engineers, passed by a Decree on 22 June 1956, was adapted to the same Act under identical conditions by Decree 2482/1966 of 10 September.

Act 30/1984 on urgent measures to reform the Public Service with respect to both bodies under the Agriculture Ministry and their present titles: *Cuerpo de Ingenieros de Montes del Estado* (National Forest Engineers Corps) and *Cuerpo de Ingenieros Técnicos Forestales del Estado* (National Technical Forest Engineers Corps). This Resolution by the Public Services Ministry of 28 October 1997 assigned both bodies to the Ministry of Environment.

The specific professional responsibilities of university graduates in this branch of engineering are not linked to the Civil Service by an administrative type of relationship. They are specified under Act 12/1986 of 1 April, a modification of the previous Act 2/1964 of 29 April which established a series of restrictions and limitations on the scope of their responsibilities, with full professional attributes in their fields as defined by Decree 148/1969 of 13 February, which regulated the titles of graduates from Technical Schools and major subjects studied at the Schools of Architects and Technical Engineering.

In Spain, the Professional Colleges, associations regulated under public law to guarantee that a professional has sufficient knowledge to perform a specific task, also cover Forest Engineers and Technical Forest Engineers. Their corresponding Colleges are a guarantee for both the citizens who contract a forestry expert, and for the professionals themselves against unqualified intrusion. The Professional Colleges are also intended to guarantee that the projects registered with them fulfil a series of formal requirements to ensure that they are viable, as set out in the recent Statutes of the Official College of Forest Engineers (Royal Decree 337/1999 of 26 February) and the Statutes of the Official College of Technical Forest Engineers (Royal Decree 614/1999 of 16 April).

Sustainable forest management plans

The current Forest Regulation expresses the need for a Forest Management Plan or a Technical Plan to be authorised by a Forest Engineer, although certain Autonomous Communities' laws enable a suitable technician to undertake this task as well, without specifying the necessary qualification. Autonomic legislation on management for game hunting and fishing activities generally follows the same pattern.

The fact that sustainable resource management plans or similar instruments discussed



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in this strategy as key points for sustainability may be used fundamentally to manage other forest functions apart from primary production such as recreational uses of forests or ecological and/or landscape conservation, for example, **makes it advisable in such cases to ensure that multidisciplinary teams are trained for the purpose** to design and manage the implementation of such plans. This type of approach would provide a guarantee of their quality and multifunctionality, which should be covered by the basic legislation. In this type of **planning or management**, knowledge of democratic principles, forestry, and economic planning of forest will be a vital part in their design, as such uses require special treatment of the forest stands, which can only be done by a professional with such knowledge, as is the case, of course, in questions of initiatives such as **reforestations** and **forest hydrology projects**. In addition to such a multidisciplinary team, the future basic forest legislation should also require participation by a graduate from a forestry school as a signatory to the project, as well as authorisation by the corresponding Official College.



APPENDIX VI: AGENDA 2.000, RURAL DEVELOPMENT AND THE SPANISH FORESTRY STRATEGY

In contrast to the prevailing trend in the European Union since its creation in 1957, the entry of eminently forest-oriented countries such as Sweden, Finland and Austria has led the Agenda 2000 to include a tentative forest policy, the most operative expression of which is the Chapter on the Rural Development Regulation.

In the 2000 – 2006 Structural Funds financial package, the forestry industry has become a fully fledged part of the CAP¹⁰⁶.

At a brief glance, one might believe that the draft Regulation is comparable to the 1994 – 1999 Community Support Framework, which led to the implementation of an EAGGF-Guidance subprogram. However, its scope is considerably broader. For the first time, the private and municipal forestry industries are provided with a funding vehicle for their activities in a comparable manner to the one enjoyed to date by farmers. Moreover, the draft Regulation not only funds socio-economically profitable forest activities, but also permits the financing of operations in forests with a fundamentally ecological purpose. If this were not the case, Mediterranean forests would be left at a clear disadvantage.

The new draft Community Regulation on rural development includes several important innovations with respect to forests which make substantial changes to the previous jointly funded initiatives. Some of the most important areas for Spain are:

a) A section on grants for the forest industry, including measures which were previously ineligible, e.g., grants for the marketing and processing of forest products are expanded to include plantations on farmland. Because the Regulation considers that forestry is a part of rural development, a new thrust is the encouragement of this sector via private initiative. This aspect is highly important in Spain, as it is a deficit sector with a serious need for investment that will only be forthcoming with the backing of public subsidies.

The eligible measures include all possible initiatives in forests and on non-agricultural land, so long as the initiatives are linked to forest exploitations owned by private individuals, associations or municipalities. In other words, grants are not only available to defend forests against natural disasters (insect plagues, fungi, etc.) and fires, but also for those that help to revitalise the sector. They include initiatives from the production stage to the transformation

¹⁰⁶ *Common Agricultural Policy*



and sale of forest products.

b) The section covering grants for the afforestation of agricultural land is maintained with the same underlying philosophy as Regulation CEE 2080/92. Grants are not only available for investment in plantations, but also for annual per-hectare subsidies to cover maintenance costs for five years, and an annual per-hectare subsidy for 20 years to cover loss of income to farmers caused by the tree plantations. The only novelty is that there is now no financial limit to the grants for maintenance and afforestation. These details may well make the afforestation programme even more attractive.

The continuity of this programme is therefore assured- a most relevant aspect in the light of the positive reception and uptake of the previous scheme.

The most immediate consequence will be strong growth in the area covered by private forests, which carried considerable weight in Spain even before the start of the Programme. This will encourage a restructuring and strengthening of the sector.

c) A new grant in the form of compensatory payments to owners of forest areas of general interest, similar to the traditional compensation payment which to date has not included the forestry industry.

The condition for reception of this grant is that owners are committed to preserving the forests which comply with requirement of being in the public interest, and carrying out sustainable management practices in them. Proprietors of such forests may receive compensatory payments provided that they guarantee the ecological stability of the forests and use the appropriate silviculture treatment for this purpose. The compensation paid is set at between 40 and 120 Euros per hectare.

This is the form of recognition of the social and public function of many forests and the need to apply the appropriate type of silviculture for their maintenance and conservation. At the same time, however, it is also the most logical means of ensuring the application of this type of silviculture, in spite of the loss of income to the owners or at least restrictions on their property rights due to the need to safeguard the public interest of the forest.

This aspect is especially important for Mediterranean forested or buffer areas and afforested zones in general that are not used primarily for production. With the assistance of such a measure, all of these areas will be able to benefit from a set of financial resources that are vital for their maintenance.

Ultimately, the three changes will lead to the integration of forest activities, along with the farming and grazing sectors, into the other policies which may influence rural development. This integrated development model is now considered by the European Union to be a priority for achieving an acceptable standard of living in rural areas, while remaining compatible with environmental conservation.



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All of this, together with the fact that according to the European Commission, Council and Parliament, the Regulation should contribute to the funding of the Natura 2000 Network, makes it necessary to establish an effective discussion forum for the future Single National Programme for Rural Development.

Participation in this forum by the Ministries of Economy and Finance, Labour, Environment and Agriculture, Fisheries and Food, which no doubt must set the pace for its implementation, along with the corresponding Departments under the Autonomous Communities, business and union organisations, is essential if the subsidiary principle, which must be observed in the application of the Regulation, is not to be used as a subterfuge of irrational inter-government infighting over the funding of certain programmes rather than. This national discussion forum should therefore be proposed at a Government level.

Nevertheless, it seems clear that certain forestry initiatives have the same scope as public infrastructure works and go far beyond the mere plantation and maintenance of forest stands. In such cases, the use of forestry engineering techniques, which are much more useful than others for achieving valuable structural changes, should not become an obstacle to their consideration as initiatives that enhance socio-economic cohesion. Hydrotechniques, restoration of torrential river beds, the capture of stormwater for the normal water cycle, etc., are all techniques that give added environmental, ecological, social and economic value to the territory.

Thus, to the extent that they can be structured into full projects rather than programmes, as governmental units for the management of a multiplicity of microprojects whose logic seeks a coherent, accumulative and synergetic effect which as a whole vertebrates and integrates the territory, they should clearly be included amongst the projects eligible for financing until the year 2006 by the Structural Funds and then by government budgets as infrastructure works with a similar and sometimes financially greater importance than the more traditional types of public works. The economies of more industrialized countries– the USA, Switzerland, Germany, the Netherlands, etc. – already view their forestry works in this light, and Spain cannot remain aloof from this modernisation process by putting more emphasis on unsustainable development models or infrastructure that reinforces this outdated pattern.



APPENDIX VII: NATURA 2000 NETWORK **AND THE SPANISH FORESTRY** **STRATEGY**

The aim of the Natura 2000 Network is to preserve the most important examples of biodiversity at a pan-European scale in accordance with the Annexes to the Habitats Directive 92/43, which may be modified to keep in step with scientific progress (Articles 18 and 19).

The main interrelated aspects are:

- ∄ The definition of the usage and management measures for forest areas included in the network as SPAs¹⁰⁷ or SCIs¹⁰⁸ which are compatible with the preservation of their positive state of conservation (Article 6)
- ∄ Cofinancing of SCIs¹⁰⁹ (article 8) via other Community instruments due to the DG-XI's lack of end-use funds for the Natura 2000 network, apart from the existence of other partial instruments such as the LIFE funds which do not finance the network in any way, but instead cover sporadic, non-systematic initiatives which must be located within areas covered by the Network, or the funds for the Rural Development Regulation.

Due to the impact of the integration of the main horizontal uses of non-urban land (agriculture and silviculture) into the preservation of biodiversity, landscape and the natural heritage in general, the priority focus of Agenda 2000 on environmental aspects as a core thrust of Community funding could be used to compensate for the handicap posed by the lack of end-use fund for the Natura 2000 Network. Obviously the agri- and silvi-environmental measures of the new Rural Development Regulation go beyond the scope of the SCIs and SCIs in the Natura 2000 Network, but these zones must obviously be considered in a special manner.

Forest areas not only cover 52% of Spanish soil. They also host the least disturbed ecosystems and thus have an added value as *refuges*, making the correct harmonisation of the sectorial policies which determine their specific management all the more important. We must also keep in mind the vital role played in the conservation of the natural heritage by

¹⁰⁷ *Special Protection Areas for birds*

¹⁰⁸ *Sites of Community Interest*

¹⁰⁹ *Special Conservation Areas*



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farmlands, especially extensively farmed zones (dry fruit crops, rice, cereals, etc.), the marine areas, their interface with the land areas (coasts), to a lesser extent the urban zones, and last but by no means least, the importance of the oldest agricultural-forestry model existing on earth- the Iberian *dehesa* or *montado*.

These forest areas do not coincide with the future Natura 2000 Network by chance. We may presume that the traditional management of these forest areas in both private and public hands (many of the latter declared as being in the public interest long ago) has enabled their biodiversity to be preserved, despite the fact that certain forest management practices have a negative impact on this conservation (as acknowledged by the Spanish Strategy for Biodiversity Conservation and Sustainable Use in Table 21, where the main processes and effects are listed).

The interface between the two aspects (management/financing) is, for the agricultural- and forestry-environmental practices, in proportional correlation between obligations and compensations, and should only be compensated when they go beyond the thresholds required by cross-compliance.

The cross-compliance obligations that may be deduced from the Spanish Forestry strategy consist of sustainable management, striving for multifunctionality by voluntary/compulsory binding to institutions such as forest certification, management plans, environmental impact studies and assessment, and forest planning. When we go beyond these obligations arising from the requirements of biodiversity conservation (e.g., subjecting forest stands to legislation covering protected natural areas, recovery plans for endangered species, or conservation requirements under the Natura 2000 Network), operations in forested areas may potentially be included in the grant systems described in the Rural Development Regulation or other potential promotion, incentive or even compensatory schemes using public funding.

It is therefore urgent to make a more precise definition of the way that these considerations influence both the final decisions to be made on which forest areas are to be included in the definitive SCI and SPA lists, and the decisions about the management obligations and sustainable practices to be demanded for the maintenance of the Network. Grant programmes for silviculture should only be defined when management practices require them to go beyond the normal requirements of sustainable/multifunctional management. These should be the guiding principles in the articulation of the operative programmes, regional development plans and other documents required in order to receive funding from the European Structural Funds or the Autonomic or National Government budgets.

There are now several discussion forums which are currently debating which of the normal requirements for biodiversity conservation should be part of standard forest management in accordance with the Resolutions of the Helsinki Interministerial Process, and become integrated in the forest certification and planning process. Other forums such as those organized by the Junta de Comunidades de Castilla-La Mancha (28-30 April 1999), and the



IV Forest Policy Forum in Solsona (6-8 April 1999) are striving to define both the participation mechanisms and the conditions deriving from the requirements (by means of voluntary and compulsory mechanisms) of forest management that moves beyond the requirements of normal sustainable management. These forums should be articulated and promoted in co-ordination amongst all parties who have been involved in the production of the Spanish Forestry strategy until a point of consensus is reached. The Spanish Rural Development Programme should contain a special section to cover these considerations.



APPENDIX VIII: EUROPEAN UNION FORESTRY STRATEGY

COUNCIL RESOLUTION OF 15 DECEMBER 1998 ON A FORESTRY STRATEGY FOR THE EUROPEAN UNION (1999/C 56/01)

Official Journal C 056 , 26/02/1999 p. 0001 - 0004 Document 399Y0226(01)

THE COUNCIL OF THE EUROPEAN UNION,

Acknowledging the benefits of a Forestry Strategy for the European Union as set out in this Resolution based primarily on the general analysis and guidelines of the Communication of the Commission to the Council and the European Parliament; Having regard to the existing legislation of the Council concerning the forest sector, as well as the proposals on the support of forestry measures in the Member States made within the framework of the Agenda 2000;

Considering the activities and commitments made by the European Union and its Member States in all relevant international processes related to forests, in particular the UN Conference for Environment and Development in 1992 in Rio de Janeiro and its follow-up (1), as well as the Ministerial Conferences on the Protection of Forests in Europe and its principles and recommendations for the forest sector;

1. **EMPHASISES** the importance of the multifunctional role of forests and sustainable forest management based on their social, economic, environmental, ecological and cultural functions for the development of society and, in particular, rural areas and emphasises the contribution forests and forestry can make to existing Community policies,
2. **IDENTIFIES** as substantial elements of this common Forestry Strategy
 - (a) sustainable forest harvesting as defined by the Ministerial Conference on the Protection of Forests in Europe in Helsinki 1993, and the multifunctional role of forests as overall principles for action;
 - (b) the principle of subsidiarity, given the fact that the Treaty establishing the European Community makes no provision for a specific common forest policy and that responsibility for forest policy lies with the Member States, nevertheless taking into account that, pursuant to the principle of subsidiarity and the concept of shared responsibility, the



- Community can contribute positively to the implementation of sustainable forest harvesting and the multifunctional role of forests;
- (c) the contribution of existing and future measures at Community level for the implementation of a Forestry Strategy and for the support of the Member States with regard to sustainable forest harvesting and the multifunctional role of forests, protection of forests, development and maintenance of rural areas, forest heritage, biological diversity, climate change, use of wood as a renewable source of energy etc., while avoiding market-distorting measures;
 - (d) the implementation of international commitments, principles and recommendations through national or sub-national forest programmes or appropriate instruments developed by the Member States;
 - (e) the active participation in all international processes related to the forest sector;
 - (f) the need to improve co-ordination, communication and co-operation in all policy areas with relevance to the forest sector within the Commission, between the Commission and the Member States, as well as between the Member States;
 - (g) the importance of the forestry sustainability for the conservation and enhancement of biological diversity, for the living conditions for animals and plants, and the fact that this sustainable forest harvesting is one of many measures to combat climate change;
 - (h) the promotion of the use of timber and other non-timber forest products from sustainably managed forests as environmentally friendly products in line with the rules of the open market;
 - (i) the contribution of forestry and forest-based industries to income, employment and other elements affecting the quality of life, whilst recognising the close connection between these two areas which influences their competitiveness and economic viability;
 - (j) the need for better integration of forests and forest products in all common sectorial policies such as the Common Agricultural Policy, the Environment, Energy, Trade, Industry, Research, Internal Market and Development Co-operation policies, in order to take into account both the contribution of forests and forest products to other policies and the impacts of other policies on forests and forest products, with the aim of guaranteeing the required consistency of a holistic approach towards sustainable forest harvesting;
 - (k) the need to encourage a participatory and transparent approach with all stakeholders recognising the wide variety of ownership regimes within the Community, which necessitates the involvement of forest owners;
 - (l) the need for specific approaches and actions for the different types of forests, recognising the wide range of natural, social, economic and cultural conditions of the forests in the Community;
 - (m) the fact that this strategy is a dynamic process which implies further discussions and activities along the lines described above,



COMMUNITY ACTIONS CONCERNING FORESTS AND FORESTRY

3. **EMPHASISES** the contribution forests have on the promotion of employment, well-being, and the environment, which fits in with the concept of sustainable forest management, based on the economic, ecological, social and cultural functions of forests,
4. **AGREES** that the Community take part actively in the implementation of the resolutions of the Ministerial Conferences on the Protection of Forests in Europe and participate pro-actively in international discussion and negotiations on forestry-related issues, in particular in the United Nations Intergovernmental Forum on Forests,
5. **CALLS** on the Commission to undertake a review of the measures in Council Regulation (EEC) No 3528/86 of 17 November 1986 on the protection of the Community's forests against atmospheric pollution (2), in order to evaluate and improve continuously the effectiveness of the European monitoring system of forest health, taking into account all the potential impacts on forest ecosystems,
6. **ADVOCATES** the continuation and evaluation of, and consideration of a possible improvement to the Community scheme for the protection of forests against fire, introduced by Regulation (EEC) No 2158/92 (3), in view of the positive impact it has had on the effectiveness of prevention measures and of the importance of coherent arrangements to protect forests, and **INVITES** the Commission to pay special attention to the development of the Community forest-fire information system, which enables the effectiveness of the fire prevention to be better assessed,
7. **EMPHASISES** the importance of continued development of the European Forestry Information and Communication System established by Regulation (EEC) No 1615/89 (4), by improving the quality and reliability of data on forests and, **UNDERLINES** the value of co-operation with the relevant national and international institutions,
8. **CONSIDERS** that Community measures in the framework of co-operation with Central and Eastern Europe as well as in the framework of the Ministerial Conferences on the Protection of Forests in Europe should promote sustainable harvesting, preservation, and sustainable development of forests; **NOTES** that the Commission has presented a proposal for a Council Regulation on Community support for pre-accession measures for agriculture and rural development in the applicant countries of Central and Eastern Europe in the pre-accession period and that support for agricultural and rural development may cover forestry inter alia; **CONSIDERS** that the said proposal may contribute to harvesting, preservation, and sustainable development of forests in Central and Eastern Europe,



9. **NOTES** that research activities on forestry in Community RTD programmes help to promote the sustainable harvesting and multifunctional role of forests and the sustainable and multipurpose use of forest resources as well as to improve research potential and to encourage innovation,

10. **EMPHASISES** the benefits of effective co-ordination between different policy sectors which have an influence on forestry, and of co-ordination at Community level; **EMPHASISES** the important role the Standing Forestry Committee, the Advisory Committee on Forests and Cork and the Advisory Committee on Community policy regarding forestry and forestry-based industries, set up by Decision 89/367/EEC (5), Decision 98/235/EC (6), and Decision 97/837/EC (7) respectively, have in this context, making use of these committees as ad hoc consultation for a providing expertise for all forestry-related activities in the framework of existing Community policies such as the Common Agricultural Policy and Rural Development, Environment, Trade, Research, Internal Market, Industry, Development Co-operation and Energy policies; and **CALLS** on the Commission to present a report to the Council as soon as possible on how to improve co-ordination,

11. **CONSIDERS** that the conservation and enhancement of biodiversity in forests is essential to their sustainable management and that appropriate measures should be integrated in the forest programmes or equivalent instruments of the Member States in line with the pan-European 'Work Programme on the Conservation and Enhancement of Biological and Landscape Diversity in Forest Ecosystems 1997-2000'; **NOTES** the added value that the Community's actions can provide through the forestry measures inside rural development and the forest protection measures as well as by specific actions such as research, conservation of genetic resources, pursuant to Regulation (EC) No 1467/94 (8) and support for the application of the pan-European criteria and indicators for sustainable forest harvesting; **CONSIDERS** that these activities and this added value contribute to the response to the requested action frame of the Community Biodiversity Strategy,

12. **RECOGNISES** additionally the need for the conservation and protection of areas representative of all types of forest ecosystems and of specific ecological interest; **NOTES** the Community contribution to the establishment, through the Natura 2000 ecological network, of protected areas consisting of 'Special Protection Areas' and 'Special Conservation Areas' set up under Directives 79/409/EEC (9) and 92/43/EEC (10) taking into account economic, social and cultural requirements, regional and local characteristics and the involvement of forest owners,

13. **HOLDS** that the role of forests as carbon sinks and reservoirs within the European Union can be best ensured through sustainable forest harvesting and that the contribution to the European Union and Member States' climate change strategies, in accordance with the Kyoto Protocol, and can best be achieved through the protection and enhancement of existing carbon stocks, the establishment of new carbon stocks and promotion of the use of biomass and timber by-products.



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14. **CONSIDERS** that forestry and forest-based commercial activities fall within the open sector of the economy and that their commercial functions should be guided primarily by market forces; **NOTES** that the Community has established a number of instruments to ensure that competition functions effectively,

15. **EMPHASISES** that priority must be given to the improvement of public and consumer opinion about forestry and forest products, assuring them that forests are managed sustainably, noting that forest certification schemes are market-based instruments which seek to improve consumer awareness of the environmental qualities of sustainable forest harvesting and to promote the use of timber and forest products as environmentally friendly and renewable raw materials, and that forest certification schemes should be comparable and the performance indicators should be compatible with internationally agreed principles of sustainable forest management principles and, furthermore, that they should comply with conditions regarding their voluntary nature, credibility, transparency, cost efficiency, open access and non-discriminatory character with respect to forest types and owners, and considering that one essential point in ensuring credibility should be the independent audit of forest harvesting; **INVITES** the Commission to consider the possibility for further action at European Union level

16. **RECOGNISES** that the existing forestry measures as well as a chapter specially dedicated to forestry inside the proposed Regulation on rural development in the Agenda 2000 (11) could provide a basis to implement the guidelines of this Resolution; **AGREES** that all common measures affecting forests and forest products should be in line with the aims and recommendations of this Forestry Strategy,

17. **NOTES** that the Commission intends to present a communication to the European Parliament and the Council on the competitiveness of the forest-based industries, a proposal revising Council Directive 66/404/EEC of 14 June 1966 on the marketing of forest reproductive material (12); a specific communication to the European Parliament and the Council shortly on forestry development co-operation,

18. **INVITES** the Commission to report to the Council on the implementation of this Forestry Strategy within five years.

- (1) UNCED, Ungass, XI World Forestry Congress, the Convention on Biological Diversity, the Convention on Climate Change, the Convention to Combat Desertification and the first, second and third Ministerial Conferences on the Protection of Forests in Europe.
- (2) OJ L 326, 21.11.1986, p. 2. Regulation as last amended by Regulation (EC) No 307/97 (OJ L 51, 21.2.1997, p. 9).



- (3) OJ L 217, 31.7.1992, p. 3. Regulation as amended by Regulation (EC) No 308/97 (OJ L 51, 21.2.1997, p. 11).
- (4) OJ L 165, 15.6.1989, p. 12.
- (5) OJ L 165, 15.6.1989, p. 14.
- (6) OJ L 88, 24.3.1998, p. 59.
- (7) OJ L 346, 17.12.1997, p. 95.
- (8) OJ L 159, 28.6.1994, p. 1.
- (9) OJ L 103, 25.4.1979, p. 1. Directive as last amended by Directive 97/49/EC (OJ L 223, 13.8.1997, p. 9).
- (10) OJ L 206, 22.7.1992, p. 7. Directive as last amended by Directive 97/62/EC (OJ L 305, 8.11.1997, p. 42).
- (11) OJ C 170, 4.6.1998, p. 67.
- (12) OJ 125, 11.7.1966, p. 2326. Directive as last amended by the 1994 Act of Accession.



COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT ON A FORESTRY STRATEGY FOR THE EUROPEAN UNION

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Introduction

On the basis of the second paragraph of Article 138b of the EC Treaty, on 31 January 1997 the European Parliament approved a resolution¹¹⁰ on the European Union's forestry strategy calling on the Commission to put forward "a legislative proposal on European forestry strategy" in accordance with a number of considerations and recommendations.

This communication has two aims:

- to present a coherent outline for a forestry strategy for the European Union;
- to respond to the European Parliament's request while taking account of the opinions handed down by the Economic and Social Committee¹¹¹ and the Committee of the Regions¹¹²;

This strategy should be considered within the scope of the principles and commitments adopted at international level and in particular within the framework of the UN Conference on Environment and Development¹¹³ (e.g. the Kyoto Protocol on Climate Change) and the pan-European Conferences on the Protection of Forests¹¹⁴.

¹¹⁰ A4-0414/96 (OJ C 55, 24.2.1997, p. 22)

¹¹¹ Opinion of the Economic and Social Committee of 24 April 1997 on "The situation and problems of forestry in the European Union and potential for developing forestry policies" (OJ C 206, 7.7.1997, p. 128)

¹¹² CoR 268/97 final - Opinion of the Committee of the Regions of 19 November 1997 on "Management, use and protection of forests in the EU" (OJ No C 64, 27.2.1998, p. 25)

¹¹³ UNCED, Rio de Janeiro 1992.

¹¹⁴ Strasbourg (1990), Helsinki (1993) and Lisbon (1998).



Spanish Forestry Strategy

The EU forestry strategy is based on the recognition of the diversity of Europe's forests, their multifunctional role and the need for ecological, economic and social sustainability¹¹⁵.

I. Certain forestry challenges facing the European Union

1. General remarks

Forest resources

Forests are estimated to cover around 3 500 million hectares (ha) or 27% of the world's total land area. More than 60% of the world's forests are located in seven countries, namely Russia, Brazil, Canada, the US, China, Indonesia and the Congo (formerly Zaire).

The European continent has nearly 215 million ha of forests and other wooded land, accounting in total for nearly 30% of the continent's land area. The forest area is currently stable or even increasing and is characterised by a huge variety of climatic, geographic, ecological as well as socio-economic conditions.

The EU has a total forest area of 130 million ha, accounting for about 36% of its total land mass. Some 87 million ha are considered exploitable forests (managed for wood production and non-wood goods and services).

In comparison with the vast boreal and tropical forests of other regions of the world, the EU's forest resources may seem unimportant at first glance. However, following the accession of Austria, Finland and Sweden, the EU has become the world's second largest paper and sawnwood producer, its foremost importer of forest products and third largest exporter of forest products.

Structure and competitiveness of EU Forest-based industries

∓ The forest-based industries consist of timber industries, that is *inter alia* sawmilling, timber-based panels, timber building components and timber packaging; pulp, paper and board production and their converting; as well as, further down-stream, printing and publishing.

¹¹⁵ For Europe, the concept of sustainable forest management was defined in 1993 at the pan-European Ministerial Conference on the Protection of Forests in Europe as follows: "the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national and global levels, and that does not cause damage to other ecosystems".



- € This industry is characterised by global, regional and local companies, including some big, globally present multi-nationals as well as hundreds of thousands of small- and medium-sized enterprises, mostly privately owned.
- € Altogether, the EU forest-based industries' production value amounts to close to 300 billion ECU, which represents 10 % of the total for all manufacturing. According to official statistics these industries directly employ some 2.2 million people, in all parts of the Union.
- € The EU is the biggest trader and second biggest consumer of forest products in the world, with a positive trade balance overall. However, within this context, the EU is a net importer of raw materials, mainly round timber, mostly from the CEECs and CIS, and woodpulp from N. and S. America and other regions having high growth rates and low costs in silviculture treatment. Within certain sectors where there is a particularly high level of domestic supply and for some, the EU is a prominent exporter, especially for the more highly value-added products.
- € The EU industry achieves advantage by using not only fresh raw material (virgin fibre), but also timber and recycled paper.
- € The EU forest-based industries depend in certain areas on a fragmented forest resource which, with other disadvantages, are tending to make EU wood less competitive than that from elsewhere.
- € Thus, to be competitive in the future, the EU forest-based industries must assure a secure and competitive raw material supply and strive for continuous specialisation, quality and innovation, supported by R&D.

Thus, it can be seen that the forestry sector is an enormously important one for the EU in economic terms.

European forest diversity

There is a wide variety of forest types as defined in terms of their bio-climatic and soil conditions. Their ecological characteristics can be divided into numerous vegetation zones, ranging from the sub-Mediterranean zone to the Arctic belt and from coastal plains to the Alpine zone.

Forestland in the EU is 65% privately owned. As there are about 12 million private forest owners in the EU, privately owned forests tend predominantly therefore to be highly fragmented into small plots usually smaller than five hectares. Ownership, however, varies widely within the Community. In Greece and Ireland, the State owns about two thirds of forestland, while in Belgium, Spain, Italy, Luxembourg, France and Germany, local communities play an important role as forest owners.

Threats to forests

Apart from deforestation as a result of urban and industrial uses and the creation of large-scale infrastructures, forests are also exposed to serious threats from air pollution, fires, climatic change, and attacks from parasites and diseases. Such threats can seriously upset and even destroy forest ecosystems. Between 350 000 and 500 000 ha of forests are destroyed by fire in the EU every year. Air pollution, on the other hand, is reducing tree



vitality and it is estimated that about one third of Europe's forests are visibly affected by air pollution.

2. Sustainably managed forests provide vital services to nature and society.

Traditionally, the foremost function of forests is considered to be their use as a regenerative source of timber and other products, such as resin, cork, mushrooms and berries : this is known as the raw-material function of forests. Besides their economic role, forests offer many other benefits which could be regarded as useful to society. Increasing leisure time, for instance, has made the recreational use of forests important socially¹¹⁶. Environmental aspects associated with forests' protective functions, like biodiversity, local and regional climates, water and soil protection, are highly valued. In mountain areas, avalanche control and protection against erosion¹¹⁷ are additional functions. Over the last decade, the role of forests in the fixation of carbon oxides has grown in importance¹¹⁸. Because forests generally perform several of these functions, their value is best illustrated by their multifunctionality. That means for example that in a forest essentially providing soil protection but which is also important for biodiversity and recreation, selective timber harvesting can be performed without any loss of the forest's functions.

3. Key issues

The major concerns in relation to forestry are:

- the promotion of the development of the forestry sector as a contribution to rural development and in particular to the creation and preservation of jobs in rural areas,
- the protection of our natural environment and our forest heritage (e.g. soil protection, erosion control, water regulation, improvement of air quality, carbon sequestration, prevention of climate change, protection of natural habitats and biodiversity) and the restoration of damaged forests,
- the maintenance of the social and recreational functions of forests,
- the improvement of ecological, economic and social sustainable forest management within the framework of the internal market, and in line with the Union's international obligations, including WTO compatible trade rules,
- support for international and pan-European co-operation to protect forests at European level and globally (see below), in particular to avoid forest

¹¹⁶ In the Nordic Countries, for example, it is estimated that at least 400 million visits a year are made to forests.

¹¹⁷ In Mediterranean forest catchment areas, soil erosion varies from 2-3 tons/ha/year while on bare soils it goes up to 20 to 30 t/ha/year.

¹¹⁸ The Dobris report points out that European Forests contain about 2.8 Gt of carbon in trees and litter, plus 3-4 Gt of C in forest soil. 2.8 Gt of carbon is the amount of carbon emitted from fossil fuels in the EU about 4 years.



- destruction in other parts of the world which could have long-term implications for the sustainability of forests and the environment of the world,
- the fulfilment of the targets of the 5th Environmental Action Programme and the protection of forests against deforestation, forest fires and atmospheric pollution.
 - promoting the role of forests as carbon trapping mechanisms and wood products as carbon sinks, especially in the post-Kyoto climate change debate,
 - promoting environmental virtues of wood and other forest products,
 - assuring the competitiveness of the EU forest-based industries.



The United Nations Conference on Environment and Development (UNCED) and its follow-up

The UN Conference on Environment and Development held in Rio de Janeiro in 1992 has given forests an increasingly important role in the context of sustainable development and environmental conservation. The concept of sustainable forest management has been recognised as a fundamental guiding principle by all participating countries. The following commitments are of particular importance:

- ∄ the non-legally binding authoritative statement of principles for a global consensus on the management, preservation and sustainable development of all types of forests;
- ∄ Chapter 11 of Agenda 21 (combating deforestation) with four main principles:
 - sustaining the multiple roles and functions of all types of forests and other wooded lands
 - - enhancing the protection, sustainable management and preservation of all forests, and the greening of degraded areas, through forest rehabilitation, afforestation, reforestation and other means of rehabilitation;
 - promoting efficient utilisation and assessment to recover the full valuation of the goods and services provided by forests and other wooded lands;
 - establishing and/or strengthening capacities for the planning, assessment and systematic observation of forests and related programmes, projects and activities, including commercial trade and processes;
- ∄ the Conventions on Biological Diversity on Desertification and on Climate Change as well as their Protocols and Work Programmes (e.g. the Kyoto Protocol).

This global process on sustainable development needs to be taken into account when devising an EU forestry strategy, in particular by:

- implementing forest-related commitments resulting from this process at European level;
- contributing to overall sustainable development in forest management co-operation through the implementation of the IPF (International Panel on Forests) proposals;
- continuing the policy dialogue on forests at international level with the aim of negotiating a legally binding instrument on all types of forests.



The pan-European process on Protection of Forests

The Ministerial Conferences on the Protection of Forests in Europe constitute a major initiative in the process of co-operation amongst European countries (38 European countries as well as the European Community) to contribute to the protection and sustainable management of European forests. They represent a joint response and a political commitment by the countries of Europe to the sustainable management and conservation of forest resources, as suggested in Agenda 21 and in the non-legally binding “Forest Principles” adopted at UNCED, taking into account the specific conditions and needs of Europe’s forests.

The resolutions adopted by the countries of Europe and the European Union at the conferences held in Strasbourg (1990), Helsinki (1993) and Lisbon (1998) are:

- S1: European network of permanent sample plots for the monitoring of forest ecosystems
- S2: Conservation of forest genetic resources
- S3: Decentralised European data bank on forest fires
- S4: Adapting the management of mountain forests to new environmental conditions
- S5: Expansion of the EUROSILVA Network of research on tree physiology
- S6: European network for research into forest ecosystems
- H1: General guidelines for the sustainable management of forests in Europe
- H2: General guidelines for the conservation of the biodiversity of European forests
- H3: Forestry co-operation with countries with economies in transition
- H4: Strategies for a process of long-term adaptation of forests in Europe to climate change
- L1: People, Forests and Forestry: enhancement of the socio-economic aspects of sustainable forest management
- L2: Pan-European criteria, indicators and operational level guidelines for sustainable forest management

The resolutions cover the main points for the protection, conservation and sustainable development of Europe’s forests and lay down guidelines for achieving those three objectives, including the implementation of objectives stemming from the Convention on Biological Diversity. The comprehensive nature of the resolutions is a major reason why the European Parliament has emphasised the importance of the pan-European process in relation to the EU forestry strategy.



II. A common strategic approach for the Community and the Member States

1. Common objective and guiding principles of the Strategy

The overall objective of the EU forestry strategy should be to strengthen sustainable forest development and management as stated in the “Forest Principles” adopted by the United Nations Conference on Environment and Development and as defined in the resolution adopted at the pan-European Ministerial Conferences on Protection of Forests (mentioned before). This approach should be defined in and implemented through national or subnational forest programmes or equivalent instruments applied by the Member States and, in accordance with the principle of subsidiarity, through action taken by the European Community where there is an added value to be gained therefrom.

A forestry strategy for the Union should comply with the following guiding principles:

- it should further the objectives of the Community policies;
- it should contribute to the implementation of international commitments entered into by the Member States and the Union;
- it should entail a flexible approach, based in particular on the principle of subsidiarity;
- it should operate in accordance with the principles of free movement of goods and free competition, as well as avoid any distortion of competition;
- it should enhance the competitiveness of the EU’s forestry sector, including forestry and forest-based industries,
- it should contribute to enhance the potential for wealth generation and rural and industrial employment within a sustainable society, particularly in many rural areas having few economic alternatives,
- it should further the principle of integration of sustainable development and environment protection in forest-related policies.

2. What role for the European Union?

The Treaties on European Union make no provision for a comprehensive common forest policy. The management, preservation and sustainable development of forests are nevertheless vital concerns of existing common policies like the CAP and the rural development, environment, trade, internal market, research, industry, development co-operation and energy policies.



The bases for action under existing responsibilities in accordance with the terms of the Treaty are as follows:

- € with their many functions, forests are essential to rural areas and constitute a major component of an integrated rural development policy, particularly because of their contribution to income and employment and their ecological and social value;
- € forests and their diversity are an important part of the European natural environment and their protection and conservation falls within the scope of a number of Community policies and is the subject in particular of specific environmental issues such as the EU Biodiversity Strategy, Natura 2000 and the implementation of the Climate Change Convention;
- € for forest products, and in particular timber (as well as cork and resins), the rules of the Internal Market apply, including the normal EU competition rules on state aids, mergers and cartels.

A number of important actions within existing Community policies have a considerable impact on forests. On the other hand, direct and indirect linkages exist between Community and national forestry policies. The Community therefore has a vital role to play in achieving the objectives laid down by the Member States and the Community in the framework of the strategy.

3. The role of the Member States

In line with the principle of subsidiarity, the Member States are responsible for planning and implementing national forest programmes or equivalent instruments¹¹⁹. These programmes are essential instruments in the implementation of the principles laid down at the UN Conference on Environment and Development, the proposals for action of the Intergovernmental Panel on Forests (IPF) the resolutions adopted under the pan-European conferences held in Strasbourg, Helsinki and Lisbon as well as Member States' initiatives in the context of international Conventions (such as those on Climate Change, Biological Diversity, Desertification, and Transboundary Air Pollution) and the 5th Environmental Action Programme.

¹¹⁹ National or sub-national forest programmes provide a global framework within which to address forestry issues in the context of sustainable forest management. They are tools for the planning, implementing and monitoring of forestry and forest-related activities and provide an environment for the concerted and coordinated implementation of programmes and activities by all interested parties on the basis of mutually agreed objectives and strategies.



III. The Community action frame

A. Introduction

While taking into account the existing Community actions related to forestry, the Community legislative action frame for the EU forestry strategy is based above all on two Commission proposals in the context of Agenda 2000: the proposal for a new regulation on support for Rural Development¹²⁰ and the proposal for a regulation on Community support for pre-accession measures for agriculture and rural development in the applicant countries of Central and Eastern Europe¹²¹. This proposed legal framework together with the existing actions constitute the Commission's response to the Parliamentary initiative.

The present Communication does not cover the evaluation of forest measures conducted in the past. An appraisal of the forestry measures has been presented, for example, in the report on the application of Regulation (EEC) No 2080/92 relating to forestry measures in agriculture¹²², the recently published reports on the health of forests¹²³, and the report on the Community information system on forest fires¹²⁴. Various assessments of practical programmes managed by the Structural Funds have also been undertaken.

B. Existing actions and their development

1. Existing Regulations relating to CAP structural and accompanying measures

The continuation of the following forestry measures is the subject of the Commission proposal on rural development in the context of Agenda 2000 and they are therefore mentioned under Section C.1:

- ∄ Forestry measures in agriculture¹²⁵ seek to promote afforestation as an alternative use for agricultural land and the development of Forest Activities on farms. This horizontal measure is part of the CAP accompanying measures

¹²⁰ COM (1998)158 final - Proposal for a Council Regulation (EC) on support for Rural Development from the European Agricultural Guidance and Guarantee Fund (EAGGF) (OJ C 170 , 4.6.1998, p. 67)

¹²¹ COM (1998) 153 final (OJ C 150, 16.5.1998, p. 14)

¹²² Report from the Commission to the Council and the European Parliament on the application of Regulation (EEC) No 2080/92 instituting a Community aid scheme for forestry measures in agriculture (COM(97)630 final, 28.11.1997).

¹²³ Forest Condition in Europe, 1998 Executive Report, ISSN 1020-587X

¹²⁴ Forest Fires in the South of the European Union 1989-1993, ISBN 92-827-5369-7

¹²⁵ Council Regulation (EEC) No 2080/92 (OJ L 215, 30.7.1992, p. 96)



(EAGGF Guarantee Section). In total, between 1993 and 1997, over 500.000 ha of agricultural land were afforested, and around 26.000 farmers have taken advantage of the scheme to improve their existing woodlands through new investments.

While stressing that it was premature to draw any firm conclusions after the short implementation period, the report mentioned before on the application of the regulation formulated some positive observations in relation to the fixed objectives of the regulation, as regards for example :

- the contribution of the scheme to rural development by encouraging pluriactivity, a dynamic approach to land use and proper maintenance of the countryside, although afforestation probably had only a small impact on reducing surplus agricultural production;
- the generation of a number of positive environmental effects such as preventing erosion and desertification, encouraging biodiversity and regulating the hydrological regime;
- the contribution of the regulation to overall regional planning policy and national forest policy objectives.

∄ The scheme to develop and optimally harvest forests in rural areas¹²⁶ includes a wide range of forestry measures to promote the economic, ecological and social functions of forests as part of the operational programmes under Objectives 1, 5(b) and 6. Furthermore, the regional development measures in Objectives 1 and 2 areas may include actions related to the forest sector. The Community is assisting the regions by a wide range of measures such as the creation and improvement of forest nurseries, soil and water conservation measures, the extension and restoration of forests and other wooded lands in areas at risk from soil erosion and flooding, the reconstitution of forests damaged by fires or other natural causes, silvicultural and infrastructural improvements and start-up aid for forest management associations. Priority is given to regional programmes in areas where the promotion of silviculture may help in improving the economy of the area concerned, where soil and water conservation and measures to combat erosion play a major role, or where the social and recreational function of the woodland is particularly important.

∄ The development of the forestry sector by improving the processing and marketing conditions for forest products¹²⁷ provides for support in the framework of Objective 5(a) for forestry operations upstream of industrial processing. The operations concerned are felling, trimming, debarking, bucking, storing, protective treatment and drying. The financing of investments is directed preferably to those concerning small and medium-sized undertakings the restructuring and rationalization of which may contribute to the improvement and economic development of the agricultural and rural environment.

¹²⁶ Council Regulation (EEC) No 1610/89 (OJ L 165, 15.6.1989, p. 3)

¹²⁷ Council Regulation (EEC) No 867/90 (OJ L 91, 6.4.1990, p. 7)



2. The Community Scheme for the Protection of Forests against Atmospheric Pollution¹²⁸

Using a suitable observation network, this measure establishes a uniform periodic inventory of damage caused to forests. The inventory provides information on the extent and development of forest condition deterioration in the various regions of the European Union. Furthermore, an intensive monitoring system in the form of a European network of permanent observation plots for monitoring forest ecosystems aims to contribute to a clearer understanding of the impact of air pollution and other factors on forest ecosystems thanks to the collection of accurate data on the extent and development of a number of forest pollutants, together with detailed information on basic ecological parameters. The European Commission and UN/ECE publish a report annually on the health of Europe's forests. The 1998 Executive Report on Forest Condition in Europe notices a steady increase in defoliation over large areas of Europe, which is influenced mainly by air pollution and long periods of drought, especially in southern Europe.

This scheme should further develop, on the basis of a scientific review, the framework for a feasible monitoring system which is at the sharp edge of work in this area and which covers the range of potential impacts such as air pollution, climate change, diseases, pests or other stress factors on forest ecosystems. It should also provide a sound database for decision-makers and for research to improve the protection of forest ecosystems.

In 1999 the Commission intends to organise a workshop bringing together scientific experts and other interested parties, with a view to preparing a critical review of the current state of knowledge and experience in this field and to open up new prospects for amending the existing legislation in the year 2001. One of the main aims of the workshop will be to streamline future activities in the field of intensive monitoring to obtain a clearer understanding of the impact of air pollution and other stresses on forests and forest ecosystems in Europe and by thus also contributing to the implementation of IPF proposals for action (No 50).

Directive 96/62/EC on ambient air quality assessment and management provides a framework for the measurement, reporting and improvement of air quality in the EU. Local and regional action plans to comply with the limit values are required. There are plans for a regular assessment of air quality, including air in forests, as an important instrument for local authorities. Forests are expressly mentioned in Annex II to the Directive as a factor to be taken into account when limit values and alert thresholds are set. Assessment of data of the impact on forests

¹²⁸ Council Regulation (EEC) No 3528/86 (OJ L 326, 21.11.1986, p. 2)



of air pollutants, particularly ozone, is therefore important and needs to be co-ordinated with existing activities, especially under Council Regulation (EEC) No 3528/86 and Commission Regulation (EC) No 1091/94.

3. Forest fires¹²⁹

Forest fires constitute a major factor endangering sustainable development in nearly half of the EU's forests. The Union is currently part-financing forest-fire prevention measures within the framework of the rural development policy and through the specific Community action to protect forests against fires.

This action underpins the efforts of the Member States to prevent forest fires, while ensuring at the same time that forestry measures with support from other sources, such as rural development in areas subject to fire risk, are linked with protection systems through the implementation of global forest-fire protection plans.

The Cohesion Fund also provides assistance for the rehabilitation of forest areas destroyed by fire with the environmental objective of preventing erosion and ensuring water regulation.

The specific action to protect forest against fires will be continued and strengthened in view of the positive impact it has had on the effectiveness of protective measures and the importance of providing for a coherent scheme to protect existing forests and new plantations.

Special attention will be paid to close co-operation with the experts of the Standing Forestry Committee and will rely in particular on the Community information system on forest fires. This system enables fire-prevention measures to be assessed more precisely and priorities to be redefined, where required; in the framework of the follow-up to the pan-European Conferences on the Protection of Forests in Europe and of the implementation of the IPF proposals for action (No 46) the system also contributes towards the development of international co-operation, both at pan-European level and throughout the Mediterranean countries.

4. Establishing a European Forestry Information and Communication System (Efics)¹³⁰

This measure which was last amended by Council regulation 1100/98 along the lines of the Parliament's resolution concentrates on achieving the following objectives:

- improving the quality of, and encouraging the changes required in, national forest inventories so they can fulfil information needs with a view to reporting on sustainable forest management, in close co-operation with the members of the Informal Intersecretariat Working Group (representatives of the Commission, Eurostat, UN-ECE, FAO, OECD and ITTO¹³¹). Special emphasis

¹²⁹ Council Regulation (EEC) No 2158/92 (OJ L 217, 31.7.1992, p. 3)

¹³⁰ Council Regulation (EEC) No 1615/89 (OJ L 165, 15.6.1989, p. 12)

¹³¹ International Tropical Timber Organization.



should be placed on the provision of objective, comparable data based on pan-European criteria and indicators and on forest ownership structure within the Union.

In addition, efforts will be made to investigate the practical application of remote sensing and Geographical Information Systems (GIS) techniques, especially in the provision of spatial data as a source of information supplementing more conventional statistics, in order to obtain standardised information on forests in Europe;

- obtaining information and achieving better communication by setting up an EU database containing all relevant information about Community measures relating to forestry as well as basic information on Member States' national or subnational forest policies and programmes;
- carrying out information gathering and analysis of the future development of the forestry sector with respect to trade, industry, employment and environmental issues.

These actions will contribute to the implementation of IPF proposals (No 89).

5. The Internal Market and EU trade

Forestry and forest-based commercial activities are part of the open sector of the economy, and the production of timber, as the main commercial function, is guided primarily by market forces.

The EU forestry sector cannot be considered in isolation from those of other countries. Any measures must be compatible with our international trade obligations as well as subject to any other commitments to which the EU is signatory. In particular, the WTO provisions on international trade, including trade and environment issues, apply to the trade of all forest products with third countries.

Fiscal measures and public aid for forestry are devised and implemented by the Member States; any aid granted by Member States to the forestry sector must be compatible with the rules of the common market and must be notified to the Commission. EU support for forestry is in general based on financial contributions within the framework of aid systems established by the Member States under their forestry policies and programmes; such support must respect market-based discipline and ensure the effective functioning of competition policy.

A number of legal instruments established at EU level influence commercial activities relating to the forestry sector. In particular these are:

- technical and environmental standards for forest products, which seek to improve the forest harvesting conditions and forest industries inside the Community and to remove any market distortion and obstacles;



- common rules on the quality and marketing of forest reproductive material, which help to ensure high quality in forest reproductive material in the Community; the Commission will shortly be putting a proposal for a new directive to the Council;
- plant-health controls: the Community is playing an increasingly active role in the protection of the health and vitality of forest ecosystems through its responsibility for preventing plant-health risks deriving from imports of forest raw materials from non-member countries.

The Commission considers that the current and proposed Community measures permit the commercial exploitation of forests within the framework of the single market and is not therefore suggesting any new initiatives in this context.

6. The EU forest-based industries

As far as the EU forest-based industries are concerned, the EU industry wants to contribute to the sustainable development of the whole forestry sector by maintaining its competitiveness vis-à-vis other materials within global competition and the challenges brought about by environmental goals, whilst taking advantage of the opportunity offered by the Information Society.

The main action points for the EU forest-based industries will be addressed in a separate, forthcoming Communication to Council and Parliament on the sustainable competitiveness of the EU forest-based industries.

7. Community support for forestry research

In the Fourth Framework Programme for RTD (1994-1998), research activities on forestry are essentially carried out by the specific programme, "Agriculture and Fisheries (including agro-industry, food technologies, forestry, aquiculture and rural development)" (FAIR). In addition, a number of other specific RTD programmes and actions are also dealt with issues relevant to forestry namely: the Environment and Climate programme, the Co-operation with Third Countries and International Organisations (INCO) programme, COST (Co-operation on Science and Technology) actions, Training and Mobility of Researchers and Technology Stimulation Measures for SMEs.

With respect to the FAIR programme, the objectives are

- i) to strengthen the competitiveness of the European forest sector by improving, consolidating and harmonising research activities in Europe and
- ii) to support the protection, development and harvesting of European forests and the Union's commitment to sustainable multifunctional management of forests.

The concept of forestry-timber chain is introduced and implemented under the FAIR programme. Projects in this field have evolved from relatively small in size and budget, solving specific problems along the "chain", to integrated ones aiming at



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optimising the efficiency and productivity of the entire "production and processing chain" and matching the sustainable production of forest resources to industrial and market needs and requirements.

Concerning the multifunctional management of forests, the priority is essentially put on:

- The socio-economic situation of the forestry sector and the policies applied therein; the prospects for supply and demand in the short, medium and long-term.
- The functioning of forestry ecosystems and the interaction between forestry and ecosystems.
- The impact of natural hazards and human activities; the causes of forest dieback, the adaptive capacity of forests, forestry protection, and the restoration of damaged forests.
- The sustainable and multifunctional management of forests, analysis, methods and suitable indicators, the appropriate afforestation, management and harvesting techniques and methods, the genetic improvement of trees for better growth, resistance and quality, and the optimisation of agricultural-forestry systems.
- Support for cork production through genetic improvement and the improvement of production, management, health protection and exploitation techniques.

The Environment and Climate programme contributes to forest research with the emphasis of forest issues linked with environmental concern. Besides fundamental ecosystem research, the impact of air pollution, climate change, fertilisation effects on European forests have been investigated. Management strategies for the conservation of carbon stores in forests have been developed and the effects of land-use change practices have been assessed by using remote sensing tools and other advanced technologies.

Research co-operation on tropical forestry, co-operation with third countries and international organisations will be subject of a future communication from the Commission on development and co-operation (see chapter 8).

As to the future, in April 1997 the Commission has put forward a proposal for the Fifth Framework Programme for RTD, which will take over during the period 1998-2002. As stated in the proposal, European research should be made more efficient and directed towards meeting social and economic needs. The concept of "Key Action" is introduced as a major research support carrier under which, multidisciplinary and integrated research efforts are focused upon problems of major socio-economic importance.

Forestry research is incorporated within the Key Action: "Sustainable agriculture, fisheries and forestry including integrated development of rural areas" under the Specific Programme "Quality of life and management of living resources".



The objectives are to provide methods and instruments for the conservation, protection and sustainable multifunctional management of forests thereby supporting the implementation of Community measures and international commitments and ensuring the sector's competitiveness and valuation. In addition, systems of forestry production and process technologies will contribute to the delivery of new or improved forest products with high value-added and lower impact on the environment. The research priorities will concentrate on:

- multifunctional management of forests: support to forest policy issues; diversification (non-wood uses, agricultural-forestry-grazing systems), multifunctional and sustainable management combining quality production with conservation and protection. Forest ecosystems biodiversity and protection of forest soils.
- sustainable and multipurpose utilisation of forest resources: the forestry-wood chain: strategies for the sustainable management and utilisation of forest resources; efficient, environmentally-friendly processes and recycling technologies; high value-added and diversified products accounting for market needs and consumer requirements.

Forest research remains a key issue in Key Action "Climate, Global Change and Biodiversity" of the Specific Programme "Preserving the Ecosystem". Priority will be given to ecosystems, biodiversity research issues and development of strategies and adaptations to climate change in order to fulfil the commitments of the Kyoto Protocol. Research issues on renewable energy systems, in particular biomass to energy systems, will also be addressed within this specific programme.

The implementation of the above RTD specific programmes will also comprise activities and mechanisms aimed at stimulating, disseminating and exploiting RTD results.

8. Development Co-operation

The overall goal of the Community forest development co-operation is to promote sustainable forest management in developing countries as a contribution to sustainable development globally. This goal will be pursued in accordance with the legal and political commitments arising from various international forums and agreements. The activities seeking to achieve this goal will have to recognise the role of forests in economic and social development, the conservation of biological diversity, action to combat desertification, carbon sequestration that mitigates climate change, and the safeguarding of natural habitats and their ecological functions. This entails the proper upgrading of natural resources and the recognition of the role of the various stakeholders in the forestry sector.

The EC will concentrate its assistance to developing countries in the forestry sector on those areas where it will have maximum positive impact, whilst taking into account the socio-economic environmental and cultural importance of developing countries' forest resources and their progress towards sustainable development.



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Priority areas for dialogue and assistance are policy and institutional reform, stakeholder involvement, capacity building and research for sustainable forest management as well as forest ecosystem conservation. Assistance will be provided at national, regional and international level, including support to fulfil commitments arising from the relevant international environmental agreements.

The Commission will soon present a communication to the Council and Parliament on Forestry Development Co-operation.

9. International co-operation

- at pan-European level:

The Community will continue its active participation in the implementation of decisions taken at the Ministerial Conferences on the Protection of Forests in Europe and will support the further development of cooperative action in this regard. This will be achieved in particular through the Community actions in relation to forest protection, research, forest information and communication as well as through the existing instruments relating to the conservation of natural habitats and genetic resources and through the continued implementation of the IPF proposals for action.

Particular attention should be paid to the protection of boreal forests in Russia and in the New Independent States and to the preservation of its privileged ecological status in particular in terms of biodiversity.

- at global level:

The Community will maintain a pro-active presence in the international discussion and negotiation forums relating to forests, in particular the IFF (International Forum on Forests), and will promote a global legally binding instrument concerning management, preservation and sustainable development of all types of forests. The Community should also seek to develop, where appropriate, international standards in the forestry sector.

10. Co-ordination

The commitments entered into in the framework of the pan-European and other international processes to establish national or subnational forest programmes emphasise the benefits of effective co-ordination between the various policy sectors which have an influence on forestry within the Member States. At Community level, co-ordination and consultation on Community measures relating to forestry will principally involve two main co-operation platforms:

- the Standing Forestry Committee¹³², which brings together representatives of the Member States with the Commission in the chair and which has three roles:

¹³² Set up by Decision 89/367/EEC (OJ L 165, 15.6.1989, p. 14)



- ∄ an advisory, regulatory and management function for specific forest measures;
 - ∄ an ad hoc consultation forum providing expertise and monitoring for forestry measures or initiatives in the framework of various Community policies such as those on rural development, environment and research;
 - ∄ a venue for the exchange of information among Member States and with the Commission and for voluntary co-ordination on international forestry issues.
- the Consultative Committees, advising the Commission, providing opinions and promoting exchange of information:
- ∄ Forests, including cork¹³³ bringing together forestry players from the professional and associated worlds in order to exchange information and opinions on forestry matters with a European dimension,
 - ∄ Forestry and Forestry-based Industry¹³⁴, bringing together representatives from the whole spectrum of EU forest-based industries and forestry, working actively through six working groups.

Co-ordination within the Commission between departments dealing with Community policies relating to the forestry sector will be organised through ad hoc interdepartmental networks depending on the subject to be dealt with.

C. Forestry measures under Agenda 2000

1. Support for the Member States in their efforts to achieve sustainable forest management

The Commission proposal on rural development policy in the context of Agenda 2000 provides a good basis for providing support for the Member States in their implementation of the strategy to promote the management, conservation and sustainable development of forests.

Taking into account the basic principles of Agenda 2000, e.g. stimulating employment and improving the quality of our natural environment and the quality of life, the main objective of the rural development proposals is to allow Member States to develop integrated programmes at an appropriate regional level to meet the diverse needs of European rural areas. Sustainable forestry management measures dovetailing with other rural development initiatives form a crucial part of the overall strategy.

Rural development programmes will accordingly enable the Community to support the implementation of national and subnational forest programmes or

¹³³ Decision 98/235/EC (OJ L 88, 24.3.1998, p. 59)

¹³⁴ Decision 97/837/EC (OJ L 346, 17.12.1997, p. 95)



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equivalent instruments in line with the objectives of rural development and in accordance with the principle of subsidiarity.

Through their regional and national programmes the Member States will work out their needs at the appropriate level and define their priorities in order to obtain a contribution from the Union to implement the forestry strategy and respond to the need for action stemming from international Conventions, such as those on Biological Diversity, Climate Change and Desertification and the implementation of IPF proposals.

The forestry chapter of the Commission proposal on rural development policy provides support for a whole range of actions to promote sustainable management of forests and to contribute to specific problems, such as biodiversity, climate change or wood as a source of energy, by means of:

- forest protection measures;
- the development and enhancement of the socio-economic potential of forests;
- preserving and improving the ecological value and restoring damaged forests and ensuring the protective functions of forests;
- promoting new outlets for the use of timber and extending the area under forests through afforestation;
- joint management of small woodlands through the setting-up of associations of forest owners;
- education and training programmes, especially targeting forest owners and managers and focusing on new opportunities and techniques for the production of goods and services from forests and on techniques compatible with the maintenance of the landscape and the protection of the environment.

Forestry measures as laid down in the Agenda 2000 proposals are integrated into the rural development programming and the reorganised financial rules. In regions qualifying for Objective 1 or eligible under the new Objective 2 these measures shall be part of the integrated programmes of the Structural Funds. The evaluating of measures covered by rural development programming including forestry measures, shall be carried out on the basis of principles and procedures laid down in the proposals. These include ex-ante, intermediate and ex-post evaluations concerning the effectiveness and efficiency of community financed interventions.

2. Pre-accession measures

The Commission has presented a proposal for a Council Regulation on Community support for pre-accession measures for agriculture and rural development in the applicant countries of Central and Eastern Europe in the pre-accession period relating in particular to:

- (a) resolving priority and specific problems for the sustainable adaptation of the agricultural sector and rural areas in the applicant countries;



- (b) contributing to the implementation by them of the *acquis communautaire* as regards the common agricultural policy and related policies.

Support for agricultural and rural development may in particular cover forestry, including afforestation, investments in forest holdings owned by private forest owners and the processing and marketing of forest products.

This Commission's proposal contributes to the management, preservation, and sustainable development of forests in central and eastern Europe, emphasis being laid on the following problems in particular:

- the health condition of forest ecosystems, disturbed mainly by industrial pollution or poorly regulated domestic heating, is a major concern; solutions to these environmental concerns need to be found in several policy areas whereas forest policy should seek to preserve or restore the forest heritage whenever possible;
- the adaptation of the forestry sector to internal market rules is uncertain since problems such as the development of ownership pattern are unclear. The Community should focus its efforts on enabling these countries to achieve sound implementation of sustainable forest-management practices and to avoid environmental threats, although the high demand for cutting is increasing owing to the recovery of the market for wood and the general economy. Community support for the processing and marketing of forest products should focus in particular on environmental issues to enable these countries to comply with the Community's environmental standards and avoid creating any distortion of competition on global markets;
- there is a clear need to improve the infrastructure and functioning of the forestry sector in the applicant countries. Promoting institutional and capacity building activities, particularly forest statistics, is important during the pre-accession phase to enable sustainable forest management procedures to be set up or reinforced. To ensure wide application of proposed measures, support to establish forest owners associations or other structures that will promote dissemination of relevant information to obtain the objectives of sustainable forest management is needed.

D. Specific items relating to forestry

1. Conservation of forest biodiversity¹³⁵

Addressing biodiversity concerns in forests requires measures in three areas: the conservation, the sustainable use and the equitable sharing of benefits arising from the use of forests' genetic resources.

In this context, actions for the conservation of forest biodiversity should be taken both "in situ" and "ex situ".

¹³⁵ See also COM(1998)42 final - Communication from the Commission to the Council and the European Parliament on a European Community Biodiversity Strategy



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Within the Union the in-situ conservation of forest biological diversity could be largely achieved by appropriate forest management systems as actually there exist only few forest areas which are withheld from commercial utilisation.

Actions for in situ conservation should consider, inter alia, two main aspects :

a) Conservation and enhancement of biodiversity in sustainable management systems for all forests to ensure that forest species are able to survive under natural conditions and are able to maintain or recover vigorous populations over their distribution area. This implies that forest managers need to take into account guidelines for, inter alia:

- € appropriate ecological site adaptation measures through diverse forestry techniques combined with accessory measures (e.g. respecting dried timber and other key micro-habitats present in forests). Particular emphasis should be given to regeneration methods, such as natural regeneration, to preserve the local genetic resources; tree species and varieties that are planted should be autochthonous or well suited to local conditions and ecosystems;
- € maintenance of forest ecosystem health and vitality by enhancing regenerative capacity, resistance and adaptive capacity of forest ecosystems;
- € restoration and rehabilitation of degraded areas, species, populations, habitats and ecosystems;
- € maintenance of traditional management of siviculture-livestock systems with high levels of biodiversity which may be lost if these areas are abandoned (e.g. in the Mediterranean regions)
- € improving felling techniques to keep related damages as limited as possible;
- € conducting afforestation measures in a manner that does not negatively affect ecologically interesting or noteworthy sites, habitats and ecosystems landscapes (e.g. the chosen tree species should be well suited to local conditions and ecosystems; autochthonous species or local provenances should be preferred; whenever introduced species are used, sufficient attention should be taken to ensure the conservation of native flora and fauna).

The implementation of such guidelines should usually be location-specific and depend on the bio-geographical and biophysical characteristics of the forests and their biodiversity as well as on economic and social aspects.

b) The establishment of specially managed protected areas as a supplementary instrument to sustainable management of forests.

The conservation of the remaining areas of primary forests and the protection of areas with high ecological fragility need specific initiatives through the establishment of protected areas.



Such protected areas should contribute significantly in furthering the management of all types of forests on a sustainable basis, and also to enhance social, cultural, environmental and economic benefits of forests. A broader “bio-regional” approach is therefore necessary which incorporates biodiversity conservation objectives with a sustainable use of the biological resources and relevant socio-economic issues when forest sites are selected on the basis of species richness, threats or biological criteria as being of international value for forest biodiversity.

The full participation of all concerned people, including forest owners, during both the decision process to establish these areas and their management is specially relevant as the conservation of biodiversity often depends on the maintenance of human activities in such areas; an active information policy in the scope of any management restrictions is required. The responsible authorities should ensure the involvement of forest owners in developments on protected areas.

In this context, the EU is contributing to the establishment of protected areas through the ecological network “NATURA 2000” consisting of “Special Protection Areas” (SPAs) emanating from the Birds Directive¹³⁶ and “Special Conservation Areas” (SCAs) emanating from the Habitat Directive¹³⁷.

Measures taken pursuant to these Directives are designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest, taking account of economic, social and cultural requirements and regional and local characteristics.

Actions for *ex-situ* conservation should consider, *inter alia*, measures related to conservation, characterisation, collection and utilisation of genetic resources in forestry in the frame of Council regulation 1467/94¹³⁸

In addition, it should be also important to enhance:

- efforts to harmonise approaches to data collection and analysis of indicators for assessing biodiversity of forest ecosystems by supporting the applications of the pan-European criteria and indicators for sustainable management in the framework of the EFICS regulation
- research actions on the impacts of management systems in biological diversity and on how forest management systems can maintain and enhance biological diversity, while ensuring their economic viability.

Taking into account the principle of subsidiarity, the Member States have the responsibility to integrate biodiversity concerns in an appropriate way in their national forest programmes or equivalent instruments.

¹³⁶ Council Directive 79/409/EEC of 2.4.1979 (OJ No L 103, 25.4.1979, p. 1)

¹³⁷ Council Directive 92/43/EEC of 21.5.1992 (OJ No L 206, 22.7.1992, p. 7)

¹³⁸ OJ No L 159, 28.6.1994, p. 1



Within the Commission's proposal on Rural Development, the Community will have the possibility to support such efforts of the Member States and in particular by supporting actions to preserve and enhance the ecological values of forest, to support training activities, to preserve and improve the ecological stability of forests or restoring damaged forests in areas of serious natural handicaps as well as by appropriate afforestation measures adapted to local conditions and ecosystems.

Furthermore it should be noted that the Community specific forestry protection measures (atmospheric pollution and forest fires) contribute to the conservation of biodiversity.

The measures proposed by the Commission in Agenda 2000 and in particular in the forest chapter of the draft regulation on rural development are a useful instrument to enhance biodiversity but much of its efficiency will depend on the relevance of the programmes and measures which will be implemented at national and regional level. Therefore, the Commission will maintain the situation of biodiversity in forests under review. Subject to the conclusions of that review, the Commission will present proposals for action on the conservation and sustainable use of forest biodiversity, in accordance with the commitments laid down in the communication on a European Community Biodiversity Strategy, and taking into account the efforts done at global and pan-European level in this context.

2. Timber as a source of energy

The White Paper for a Community strategy and action plan entitled “An Energy Policy for the European Union”¹³⁹ predicts that the percentage of energy produced from renewable sources will amount to 12% of total energy by the year 2010 (the current level is less than 6%), and thereby anticipates a substantial increase in the use of biomass for energy purposes in addition to extensive use of hydropower, wind and solar energy. The potential that forests can play as a source of energy, either by short rotation plantations or by the use of forest residues and available low quality timber should be favoured.

When exploring the possibilities of increasing the potential of energy crops from forestry, the following considerations must be taken into account:

- the potential of timber-based biomass as a source of energy should not be overstated on the basis of general theoretical data about the availability of forest resources, because these resources vary in distribution and type, which partly explains the difficulty in evaluating their real potential for energy use at EU level;
- at present timber is in most cases a more expensive raw material for energy production than competing products. One way to address this could involve adjusting taxes. Any change in tax systems in the Member States or at EU level

¹³⁹ COM (95) 682 final of 13 December 1995.



should take due account of demand for timber by-products and the requirements of industry for sustainable timber products;

- although short rotation forestry for energy production can contribute to a slowing of the rise in atmospheric carbon dioxide concentrations, care should be taken to ensure that this does not have adverse effects on the environment.

The issue of Community support for the use of timber as a source of energy is currently being discussed within the framework of the Commission proposal on Rural Development.

3. Climate change

As explained in the Commission Communication entitled “Climate change - Towards an EU post-Kyoto strategy”¹⁴⁰, forests play an important role in the global carbon cycle. In some regions they are net sources of carbon dioxide, primarily as a result of deforestation and forest degradation, whereas in other regions, including Europe, they act as net carbon sinks. There is however little scientific knowledge available to date about the potential of carbon sinks in relation to forest ecosystems and research efforts in this area must therefore be stepped up. The authoritative Intergovernmental Panel on Climate Change (IPCC) estimates that about 12% to 15% of projected carbon dioxide emissions from fossil fuel consumption world-wide from now to 2050 could be absorbed by slowing deforestation, promoting forest regeneration and increasing the area in plantation and agricultural-forestry systems. Tropical America has the greatest potential for increasing carbon storage, followed by Asia and tropical Africa¹⁴¹. However, this will not preclude the Community to encourage the optimisation of the sequestration capacities of European forests.

The potential of forests and forest soils as a carbon sink within the Union can be best utilised through the sustainable development and protection of our forests, even if our contribution to the global problem will remain rather limited. Furthermore, carbon uptake and storage by forests is a long-term process, which may have significant impact on a time scale of 20 to 50 years or even longer.

Forests can contribute to carbon storage through:

- € maintaining and/or increasing existing carbon pools by improving existing forest protection and management;
- € expanding forest area through afforestation of farming land, with species adapted to local conditions or preferably native species or local provenances;
- € replacing fossil fuels with fuelwood from sustainably managed forests;
- € replacing high-energy products (e.g. steel, aluminium and concrete) with industrial timber products (low-energy renewable raw material).

¹⁴⁰ COM (1998) 353 final.

¹⁴¹ FAO report on state of the World's Forests, 1997.



All these objectives can be achieved through various forest management practices, land-use practices and marketing efforts which, in line with the principle of subsidiarity, should primarily be initiated by the Member States.

Reporting and verification are major issues which foresters have to face in the future. There is a specific need for a transnational system of accounting, based on current update methodologies, involving measurements, modelling and data-basing in order to fulfil the requirements of transparencies and verification of the implementation of the Kyoto Protocol.

The Community will make full use of its existing instruments such as the forest protection measures, research and development and the proposed forest measures in rural development to support the efforts of the Member States in relation to climate change, whose potential effects on the health status of our forests can not be underestimated either. The Commission will remain open-minded on the possibility of any further instruments.

4. Forest certification

Forest certification is defined as a procedure which consists of the verification, by an independent third party, that the forests in question are managed in a sustainable way. Related labelling to forest certification can be a mark guaranteeing that the raw material of a defined wood-based product is originating from a certified forest.

Forest certification therefore only refers to forest management and not to the entire life cycle of the wood-based product¹⁴².

Forest certification systems and related labelling are market based instruments which aimed primarily to promote the sustainable management of forests and the use of forest products coming from renewable and sustainable sources.

In Europe such systems are also likely to contribute to improve consumer information on the environmental qualities of sustainable forest management and to promote the use of timber as an environmentally friendly and renewable raw material. The main objective is to establish comparability, credibility through sufficient verification of conformity to standards or performance indicators.

Forest programmes and policies of Member States are nevertheless the key instruments for ensuring that sustainable forest management and certification schemes can act as an additional incentive.

European forest-certification schemes and related labelling should be based on criteria and performance indicators comparable and compatible with internationally agreed principles. In addition, they should respect the following general principles: voluntary nature, credibility, transparency; cost effectiveness

¹⁴² This aspect is covered by the Commission's proposal for a Council Regulation (EC) on a revised Community eco-label award scheme (COM/96/0603 final, OJ C 114, 12.4.1997, p. 9), amending Council Regulation (EEC) No 880/92 of 23 March 1992 on a Community eco-label award scheme.



participation of all related interested parties, open access and non discrimination with respect of forest types and owners. One essential element providing credibility is the independent audit of forest management and chain of custody.

The Commission welcomes the initiatives taken by governments, regional authorities, NGO's or private sector for the potential experience they can offer. Recently, representatives of forestry, forest industries and trade from several Member States began to elaborate a pan-European forest certification and authentication framework based on the pan-European criteria and indicators for sustainable management. Given certain limitations, risk of duplication and lack of comparability of all these initiatives, the Commission will analyse them and consider the need for possible supplementary action at EC level, possibly involving a legal instrument laying down essential requirements for voluntary certification and labelling initiatives. Such an instrument would then provide for the introduction of an EU logo for sustainable forest management and address such issues as sustainable forest management standards, the level of assessment, auditing bodies, the chain of custody and dispute settlement.

E. Conclusion

At present the Commission considers that, together with the proposals on rural development in the context of Agenda 2000, the existing forestry measures provide an adequate contribution to an EU forestry strategy. The prolongation and eventual revision of the existing forestry measures will be envisaged in line with the objectives and recommendations of this strategy. The Commission will present at an appropriate time any further actions such as for example a Community framework for voluntary forest certification and related labelling initiatives in the Union.

The Commission calls on the Council to adopt the strategy as presented in this Communication.



APPENDIX IX: RESOLUTIONS FROM THE MINISTERIAL CONFERENCES ON FOREST PROTECTION IN EUROPE

TABLE OF RESOLUTIONS

RESOLUTIONS FROM THE MINISTERIAL CONFERENCE HELD IN STRASSBOURG (FRANCE) IN 1990.

RESOLUTION S1: EUROPEAN NETWORK OF PERMANENT SAMPLE PLOTS
FOR MONITORING OF FOREST ECOSYSTEMS

RESOLUTION S2: CONSERVATION OF GENETIC RESOURCES IN FORESTS

RESOLUTION S3: DECENTRALIZED EUROPEAN DATA BANK ON FOREST
FIRES

RESOLUTION S4: ADAPTATION OF MOUNTAIN FORESTS TO NEW
ENVIRONMENTAL CONDITIONS

RESOLUTION S5: EXPANSION OF THE EUROSILVA NETWORK OF
RESEARCH ON TREE PHYSIOLOGY

RESOLUTION S6: EUROPEAN NETWORK FOR RESEARCH INTO FOREST
ECOSYSTEMS

RESOLUTION H1: GENERAL GUIDELINES FOR THE SUSTAINABLE
MANAGEMENT OF FORESTS IN EUROPE

RESOLUTION H2: GENERAL GUIDELINES FOR THE CONSERVATION OF
THE BIODIVERSITY OF EUROPEAN FORESTS

RESOLUTION H3: FORESTRY CO-OPERATION WITH COUNTRIES WITH
ECONOMIES IN TRANSITION

RESOLUTION H4: STRATEGIES FOR A PROCESS OF LONG-TERM
ADAPTATION OF FORESTS IN EUROPE TO CLIMATE CHANGE



RESOLUTION L1 : PEOPLE, FORESTS AND FORESTRY: ENHANCEMENT OF SOCIO-ECONOMIC ASPECTS OF SUSTAINABLE FOREST MANAGEMENT

RESOLUTION L2 : CRITERIA, INDICATORS AND PAN-EUROPEAN GUIDELINES AT AN OPERATIVE SCALE FOR SUSTAINABLE FOREST MANAGEMENT



RESOLUTIONS FROM THE MINISTERIAL CONFERENCE HELD IN STRASSBOURG (FRANCE) IN 1990.

RESOLUTION S1: EUROPEAN NETWORK OF PERMANENT SAMPLE PLOTS FOR MONITORING OF FOREST ECOSYSTEMS

THE SIGNATORY STATES AND INTERNATIONAL INSTITUTION,

considering that forests in Europe make up an ecological, cultural and economic heritage that is essential to our civilization,

considering that studies of the health problems of forests in the last decade:

- have shown that some forest ecosystems are in a precarious state due to various factors, notably air pollution and certain meteorological events,
- have made clear the need for and the great scarcity of reliable data on these ecosystems, particularly for the period preceding the reported incidents,
- have, notably under the auspices of the United Nations Economic Commission for Europe (Convention on Long-Range Transboundary Air Pollution, Geneva, 1979), given rise to important and fruitful work, which has led to the finalizing of jointly-agreed methods for assessing pollution and the state of forests,

considering that, apart from the continuing impact of air pollution, it is to be feared that further pressures are likely, such as climatic changes arising from the greenhouse effect, or others as yet totally unforeseen,

considering that it is important to draw the right conclusions from the experience and knowledge acquired in the field of forest management methods that encourage the vitality of



forest ecosystems,

considering that it is necessary to detect as soon as possible every significant change in the functioning of forest ecosystems, and to be able to define their characteristics and analyse their causes swiftly,

considering that it is necessary to determine whether the changes observed to date can be interpreted as falling within the fluctuations around a stable average observed in the recent past,

considering that it is necessary to know the critical levels and critical loads of pollution liable to bring about the destabilization of different forest ecosystems,

considering that the significant effort already made to better understand the evolution of forest eco- systems, often characterized by their fragile nature, should lead to an advance in the resolution of serious problems identified by monitoring, will endeavour to put in their respective countries the recommendations concerning assessment and monitoring put forward by the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests.

THE PRINCIPLES

1. The efforts already made to monitor the state of forest ecosystems, within the framework of the various regional, national or international programmes, must be reinforced. Most of these programmes were originally set up to gather the information required for an ecologically responsible management of timber harvesting. At the beginning of the eighties, the concern felt at the damage caused to forests by air pollution led to important international actions, notably in the context of the various study groups set up under the auspices of the Convention on Long-Range Transboundary Air Pollution. With the opening of the nineties, general awareness of the fragility of many European forest ecosystems justifies the continuation and strengthening of initiatives already undertaken.

2. The strengthening of present efforts in monitoring forest ecosystems aims at improving the ways of managing timber harvesting in an ecologically-responsible fashion, and also at adopting the means needed for an effective environmental protection policy. These aims require:

2.1. the availability of a permanent mechanism for the gathering of objective and, wherever possible, comparable data, that will allow a better diagnosis and analysis of existing and future problems in all their geographical and temporal variability,

2.2. an evaluation of the quantitative development of factors that affect the functioning of forest ecosystems and timber harvesting, as well as the reactions of these ecosystems to air pollution, stress, climatic fluctuations, storms, fires, human interventions, etc...

2.3. the adoption of permanent arrangements by which progress may be made in



determining relations between cause and effect, for example, by characterizing for a given ecosystem the local pollution level and the critical threshold of pollutants responsible for the ecosystem's destabilization.

3. The monitoring of forest ecosystems should rely simultaneously on two levels of permanent sample plots: W sample plots for elementary systematic monitoring W sample plots for intensive monitoring
 - 3.1. The sample plots for elementary systematic monitoring are positioned on the intersection points of systematic inventory grids, with a density at least equal to that recommended by the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests. This type of systematic network allows regional assessments and statistical research to be carried out, thus providing the data needed for forestry and environmental policy. It also permits the orientation of observations and measurements on to the intensive monitoring sample plots.
 - 3.2. The intensive monitoring sample plots are installed in order to obtain detailed data on the evolution of a number of forest ecosystems in Europe. This type of approach allows correlations to be established between the variation of environmental factors and the reactions of ecosystems, or, for example, allows us to determine the critical level of pollutants likely to destabilize one type of ecosystem. The data it provides allows a better interpretation of the findings derived from the systematic network.
4. The need for a better grasp of the geographical and temporal variability of the parameters measured and the problems studied, in order to be able to give more precision to a responsible policy for the forest and the environment, justifies a reinforcement of the effort to harmonize the monitoring methods for forest ecosystems and to analyse the data obtained. The comparability of data on the European scale must be developed.
5. The necessity of taking into account the historical dimension of the evolution and variation in forest health, site conditions and climatic events justifies a larger and co-ordinated effort to describe such fluctuations in the past.
6. Priority must be given to the coherent long-term tracking of the data already gathered within the existing systems, as well as to supplementing this data with new measurements, which can contribute as rapidly as possible to the thinking and decisions of national and international authorities.
7. The HAMBURG and PRAGUE co-ordination centres, set up within the framework of the technical programmes linked to the Convention on Long-Range Transboundary Air Pollution, should intensify the international co-ordination of these networks, as well as the work of synthesis and interpretation of the data on the scale of large ecological regions or large types of forest ecosystems in Europe, thanks to the funding guaranteed by all the member countries. To this end, minimum batches of data, gathered in a standardized form to be determined later, are transmitted to the centres.



The Joint Project

1. The network of elementary systematic monitoring takes into account the estimation or measurements of some simple parameters concerning ecological site conditions and tree vitality. The inventories currently carried out will have to be progressively completed along these lines, following the recommendations of the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests.
2. The intensive monitoring sample plots are designed for more numerous and finer estimations and measurements, describing the stand and its history, the trees and their foliage, the vegetation, the soil, the climate, and, in a certain number of cases, the chemical composition of open-space rain, intercepted rain, and drainage water. As far as it is possible, some of these sample plots should be installed on-site or in the immediate vicinity of stations for measuring atmospheric pollution.
3. The special team of the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests must draw up the minimum list of the parameters pertaining to the sample points of the elementary systematic monitoring and the intensive monitoring, as well as the recommended methods of analysis.

National and International Co-ordination Bodies

1. All the countries taking part in the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests are invited to participate in this project and to gather data which will be forwarded to the HAMBURG and PRAGUE co-ordination centres.
2. All the European countries concerned by the danger of the destabilization of forest ecosystems feel the need for reinforced international action, to make the permanent monitoring of these ecosystems even more effective and, in a more co-ordinated manner, to make better use of the experience already gained by many countries or through international programmes that are already set up, such as the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests and the other relevant programmes of the Economic Commission for Europe of the United Nations within the framework of the Convention on Long-Range Transboundary Air Pollution (Geneva, 1979), the FAO/ECE 1990 inventory of forestry resources, the EEC's action for the protection of forests against air pollution and in particular its inventory of damage to forests, and the joint research programmes of the Nordic Council of Ministers. The exchanging of information and the co-ordination of projects must be encouraged and reinforced.
3. The HAMBURG and PRAGUE co-ordination centres, set up within the framework of the Convention on Long-Range Transboundary Air Pollution (Geneva, 1979) should have the responsibility of - collecting a certain amount of data produced by the elementary systematic network as well as the intensive monitoring network, and for presiding over the management, utilization, synthesis and interpretation of the data provided. The list of data to be transmitted to the co-ordination centres will be set out in the proposals made by the special teams of the International Cooperative Programme on Assessment and



Monitoring of Air Pollution Effects on Forests. Each member state of the network contributes to the cost of these centres.

RESOLUTION S2:

CONSERVATION OF FOREST GENETIC RESOURCES

THE SIGNATORY STATES AND INTERNATIONAL INSTITUTION,

considering that, above and beyond the conservation of forest species, the essential objective is the conservation of the genetic diversity of these species, which are an essential part of mankind's heritage,

considering the seriousness of the risk of the impoverishment or modification of this great diversity,

noting, furthermore, that the priceless wealth represented by the intra-specific variability of species currently present in Europe is often largely due to their very wide natural distribution, which covers a wide range of ecological conditions,

recognizing, also that the use of genetically-improved materials is of great importance for reforestation in particular where this is for timber harvesting purposes.

commit themselves to implement in their own countries, using whatever methods seem most appropriate, a policy for the conservation of forest genetic resources.

THE PRINCIPLES

1. Our responsibility vis-a-vis future generations and the urgency of the problems lead us to undertake, without waiting for all the scientific answers, immediate actions within the framework of available resources.
2. The strategy chosen should take into account the present state of knowledge and of the concerns expressed, and give preference to simple, stable and long-lasting methods



capable of taking into account developments in knowledge and demand.

3. The variability to be conserved is the total genotypic variability (among species, strains and individuals) and not just the variability of individual genes.
4. In view of the objectives and constraints set out above, in situ conservation should be emphasized and integrated in the field of forest management. Ex situ conservation in the form of collections of genotypes as well as the conservation of seeds or of in vitro cultures, are other complementary possibilities that should not be neglected.
5. The conservation of the genetic diversity of forest species that are currently of secondary importance should, initially, and as a general rule, be assured by preserving forest ecosystems and rare forest species.
6. The specific means for conserving forest genetic resources whose principles are set out above should be backed up by recommendations drawn up by each country on the silvicultural techniques practised, at least in public forests.

Note: these recommendations may cover, for example, protection against contamination or dilution of genetic resources within zones identified as being of special interest, the maintenance of sufficient diversity in the choice of afforestation and restocking species, the keeping – at least for public forests – of records covering the exact identity of the reproduction materials used for planting and regeneration, etc.

7. The bodies dealing with the co-ordination and technical organization of national and methodologically-specific programmes to conserve forest genetic resources should be adequately supported.

AN INSTRUMENT FOR CO-OPERATION ON CONSERVATION OF GENETIC DIVERSITY OF EUROPEAN FORESTS

1. To facilitate and extend the efforts undertaken at national and international levels, a functional but voluntary instrument of international co-operation should be found without delay from among the existing relevant organizations to promote and coordinate:
 - 1.1. in situ and ex situ methods to conserve the genetic diversity of European forests;
 - 1.2. exchanges of reproductive materials;
 - 1.3. the monitoring of progress in these fields.



RESOLUTION S3:

DECENTRALIZED EUROPEAN DATA BANK ON FOREST FIRES

THE SIGNATORY STATES AND INTERNATIONAL INSTITUTION,

considering that forest fires constitute a major problem from the ecological, social and economic points of view of many European countries, particularly in Southern Europe, and that this problem may in the long term have an impact on climatic changes,

considering that the States hit hardest by forest fires have in the course of the last decade increased the financial means devoted to the protection of forests, to infrastructures on the land and to the purchase of fire-fighting equipment, thus enabling them to increase the effectiveness of the systems set into place,

considering that it is difficult to control these disasters which have attained important dimensions, and that consequently, prevention actions must be developed capable of resolving this problem in a lasting way, by reducing the number of fires that break out, by diminishing the amount of fuels available, and by watching for fire outbreaks and intervening as quickly as possible,

observing that each State has installed, often at the cost of considerable difficulties, its own system for gathering information on fires in different vegetation types, notably in forests and on heathers, and that in this matter those countries generally considered to be the most exposed to fire risk often hold more information or have a more advanced system corresponding to specific needs,

considering that the pooling and exchange of such data between the countries concerned has already been recommended by many international organizations, such as the



Food and Agriculture Organization of the United Nations (FAO), the United Nations Economic Commission for Europe (UN-ECE), the European Economic Community and Silva Mediterranea,

considering that an information system is of much more value than the mere mass of data that it contains, insofar as it reflects choices of objectives and ways of organization,

taking formal note of the actions already carried out and the efforts already accomplished under the aegis of the joint FAO/ECE Working Party on Forest Economics and Statistics with regard to collecting and distributing statistics on forest fires in Europe, but considering that a further effort on the part of European countries is needed to gather together precise and comparable data on outbreak and first moments of fires, in order to better accompany the prevention policy,

considering that the establishment of a European data bank on forest fires would by its nature permit dialogue between the different countries concerned,

considering that the comparison of different indices of fire-risk prevailing in the States would enable the determination of a single index for Europe, and thus ensure better forecasting on this scale,

considering that in order to inform and alert the European public, it is necessary to know the precise causes of forest fires, their socio-economic context, and even the motives or psychology of arsonists, in order to better ensure the necessary prevention,

commit themselves to study the feasibility of a decentralised European data bank on forest fires.

THE PRINCIPLES

1. The aim of such a project would be to facilitate and to promote, within a decentralized European data bank constituted by a network of national data banks, the exchange of a certain amount of information on forest fires, of practical use in implementing a prevention policy.
2. This system, which does not aim at replacing the different national systems by a standardized universal system, would limit itself to synthesizing the mass of common data made available to the network's participants.
3. A common language will be aimed at in analysing the diverse situations and their practical consequences in order to facilitate co-operation between countries. To this end, it would be preferable to give precedence to a modest objective to increase the system's performance. Having a reliable and systematic inventory, comparable over a large part of Europe, would already be a considerable benefit.



Spanish Forestry Strategy

4. It is not so much a question of holding radically new data than of procuring the means of improving the reliability and precision of data already in hand. A project of this kind could not serve as an instrument for the development of national policies, but it might well contribute to better evaluating the techniques used by each country. For example, it would be valuable to be able to exchange results on the systems used for the rapid detection of forest fires, considering that the diversity of existing solutions is considerable.
5. With this in mind, a project of this kind should enable States to set up or maintain in service a more comprehensive data bank, containing information more specific to their particular needs, and whose access would be reserved exclusively to them.
6. The different systems used should be compatible with each other, notably in view of the possibility of long-distance consultation.
7. The system set into place should be capable of evolving in phase with changes in techniques and situations, as well as developments deriving from experience. It should be designed as a communication system: the quality of exchanges between the national and international partners would indeed be the determining factor for the pertinence of data gathered, and would be obtained by using good communication techniques and by efficiently guiding the networks feeding each national data base.



RESOLUTION S4:

ADAPTING THE MANAGEMENT OF MOUNTAIN FORESTS TO NEW ENVIRONMENTAL CONDITIONS

THE SIGNATORY STATES AND INTERNATIONAL INSTITUTION,

considering that the ecological richness of mountain environments (animals, plants and ecosystems of special interest) depends notably on the presence of large areas of highly diversified forests; that are considered and appreciated at large as a natural environment, as an element contributing to the quality of landscapes, as an area for recreation and as a buffer against natural hazards,

considering that the fragility of mountain ecosystems, which are subject to strong pressures and whose ability to react to disturbances is low, justifies their being paid a great deal of attention, in particular as to the state of their health,

considering that mountain forests, in their diversity, are of crucial value to people because of the various roles that they play, in particular in the protection of natural environments, the fight against natural risks, and the regulation of the hydrological cycle,

considering the place mountain forests occupy in regional management and development,

considering that, among the dangers created by industrial civilization and weighing on these fragile eco- systems are to be numbered long-range air pollution, the risk of climatic changes due to the green-house effect, as well as forest fires,

observing that, in most mountain areas, timber harvesting is often becoming less profitable due to the difficulty of extraction and precarious economic conditions, and

considering in consequence the difficulty of carrying out the silvicultural works necessary to ensure the survival and the balance of these forest ecosystems, which have been



modified by human intervention,

considering that forecasts relative to the place and role of mountain forests must take into account the economic, social and cultural context of the region in question,

noting that the economic development of mountain areas can give rise to conflicts over land use and lead to environmental pressures due in particular to large-scale tourism, especially as, by their nature, mountain ecosystems are particularly fragile,

observing that in regions of agricultural and forestry decline where man is abandoning forest stands and large grazing areas, which are sometimes spontaneously colonized by trees, uncontrolled and often harmful changes are taking place,

considering that the pressure by game or domestic animals must be controlled so that the protection of existing stands and their regeneration can be ensured,

considering that public authorities must take charge of the prevention of natural dangers and the protection of the irreplaceable ecological heritage of mountain forest areas,

considering that it is opportune to equip ourselves with efficient instruments of analysis, notably of statistical nature, to ensure, in concert with local representatives, a genuine heritage-oriented management of mountain forest areas,

conscious that in order to better adapt the interventions of the forester to the local context, it is necessary to improve our knowledge of mountain forests in all their diversity and richness, as well as in their own dynamics,

conscious that considerable progress has to be made so as to better understand the functioning of mechanisms of protection against natural hazards in order to put public investments to the best use and to regulate the management of these fragile environments in concert with all the local partners,

commit themselves to strive to mobilize their resources in common so as to advance together in a few concrete projects which are the buns of their forest policy for mountain ecosystems.

THE PRINCIPLES

1. The improving of mountain forests should be based on a deeper knowledge of all that constitutes the environment (forest stands, soil, flora and fauna, climate ...), whereby all the local ecological factors would be taken into account in determining the geographic management units and in selecting actions to be implemented therein. This would suppose that we gather data on flora and fauna, rare environments and landscapes of quality not by limiting ourselves to timber yielding forests alone, but by an overall study by valley or watershed.

Note: the presence of an animal or plant species of special interest in an area that includes wood- land must be taken into account in the elaboration of the various possible silvicultural scenarios and the proposals concerning objectives assigned to



stands.

When the conservation of a biotope vital to the survival of a species is subject to strong constraints, it is incumbent on all the interested parties in the region in question to find a common solution.

2. To be able to understand the problems as a whole, by theme, and by following projections of change, a truly ecological cartography should be established with a view to translating, on the scale of the valley or watershed, all observations relating to the environment, notably maps of stands, of the flora and fauna, along with data on natural hazards,

Note: digital cartography and recent developments in the field of geographical information systems should offer considerable possibilities in this regard.

3. These operations should lead to the setting up of data banks for mountain forests on the national level, which could be interconnected to enable international consultation.

4. It will be vital that we acquire a better understanding of interactions between the vegetation cover, torrential floods and erosion, and more generally what are the relations between the hydrological cycle and the flora, the soil and parent rock, in order to better assess the dangers generated by changes in land use and to elaborate in response to them appropriate strategies, which take into account local constraints.

5. Considerations economic as well as ecological lead us to be aware of the dangers of an uncontrolled artificialization of mountain forest environments and urge us to limit heavy investments wherever a stable ecosystem can be obtained by natural means, which should always accompany civil engineering, and take precedence over the latter when they offer the same guarantees of effectiveness.

6. Where revenue from a mountain forest is insufficient to ensure the carrying out of silvicultural works indispensable to the continuity and stability of stands, which are often mixed and irregular, complementary financing schemes should be set up, which involves joint responsibility by the users of the mountain for conserving the heritage of these fragile ecosystems.

7. The experience gained in the management of mountain forest environments by the different European countries is rich and diverse. They are now confronted with the need to change their practices to avoid destabilizing these fragile ecosystems and provide long term sustainable resource management. It is necessary to propose efficient methods of analysis and a range of socio-technical options.

JOINT PROJECTS

1. An international working party, for example that of the European Forestry Commission on the Management of Mountain Watersheds in liaison with the Commission of the European Communities, could pool the expertise gained by the experiences of the different European countries and propose methods of defining and taking into account indices of stability, which assess the ability of forest stands to resist internal and external pressures,



and which are useful to planning and management in mountain forestry.

2. Given the number of forests regarded as natural or little transformed in Europe, and, because of their ecological diversity, liable to become a “field” of study for the perfection of our analytical methods and our knowledge of the specific dynamics of mountain forest ecosystems, we shall encourage studies that aim at defining what is the minimum level of forest operations to be practised to ensure lasting stability of the ecosystem.

3. The drawing up of a co-ordinated research programme on mountain forests, bringing together teams working in different countries, could be requested from the specialized section of the International Union of Forestry Research Organizations (IUFRO) in liaison with the European Forestry Commission’s Working Party on the Management of Mountain Watersheds and the management committees for the research and development of the programme dealing with forests of the European Communities Commission.

4. To facilitate the exchange of information and experience, certain posts in research-development teams or with forest unit managers could be proposed in a list to be circulated yearly in all the interested countries. These posts would accommodate foresters who have gained experience concerning mountain forests in their own country for a duration of one to three years, according to the administrative arrangements of each host country or the agreements made between the country of origin and the host country.

RESOLUTION S5:

EXPANSION OF THE EUROSILVA NETWORK OF RESEARCH ON TREE PHYSIOLOGY

THE SIGNATORY STATES AND INTERNATIONAL INSTITUTION,



considering that because of the development in silvicultural techniques, trees are sometimes subject to nutritional deficiencies, to competition or reaction to climatic and other conditions, whose consequences have not always been foreseen and which may lead to serious difficulties, in particular to phenomena of decline in health,

considering that the impact of long-range air pollution or the consequences of global climate changes that may ensue on the greenhouse effect may substantially aggravate these difficulties,

considering that, to conserve the stability and vitality of forest ecosystems, it is important that we better understand the adaptation capacities of woody plants, and the limits of these capacities, so as to be able to react by elaborating appropriate strategies,

observing that, in order to make progress in basic scientific disciplines, such as genetics, pathology or entomology, a better knowledge of the functioning of the tree is required, to understand and master its relationship with its environment,

considering that this desired improvement of knowledge should also cover the physiology of healthy trees as much as the malfunctionings that affect trees subject to attacks by living organisms or by stressful situations,

bearing in mind that the Oak nr 3 resolution of the SILVA International Conference on Trees and Forests, held in Paris in December 1986, recommended the setting up of EUROSILVA, an advanced research network on the physiology of trees,

considering that with the experience gained over the last two years by Franco-German co-operation this EUROSILVA network can now take on the truly European dimension desired by the SILVA conference, and that certain research and development projects co-financed by the European Communities contribute to the promotion of a successful international co-operation,

recognizing the specificity of tree physiology and of the quality of the teams already engaged in various research programmes covering tree physiology,

conscious of the need to reinforce and to structure bilateral and multilateral relations between the research institutes, as well as between the research workers,

conscious of the necessity to support these research programmes and this co-operation with appropriate resources, which notably may be national in origin, in such a way as to enable current researches to be reorganized and research teams to be directed towards fundamental themes hitherto neglected,



commit themselves to set up a joint European research programme on tree physiology within the expanded EUROSILVA network, in accordance with the Oak nr 3 resolution of the SILVA conference.

THE PRINCIPLES

1. The EUROSILVA network has, as its goal the development of co-operation between research institutes and researchers in the following four fields:
 - 1.1 influence of stress and diseases on trees
 - 1.2 tree physiology, biochemistry, biotechnology
 - 1.3 molecular biology of trees
 - 1.4 methods of studying tree physiology
2. After the establishment of an inventory of scientific resources in each country, the possible complementary features between programmes thus revealed should lead to exchanges of researchers for periods of a few weeks to a year and to continuing collaboration.
3. The EUROSILVA network is intended to encourage and sponsor scientific meetings at different levels, as for example:
 - 3.1 joint seminars with two or more teams
 - 3.2 colloquia or workshops on very precise subjects, bringing young researchers in contact with recognized specialists
 - 3.3 workshops centred on specific techniques
 - 3.4 series of lectures given by top-level researchers in different countries Existing co-ordination mechanisms, flexible but official, could guide the network in each country and internationally



THE JOINT PROJECT

1. The European network of advanced research on tree physiology, known as EUROSILVA, working in the manner described above, is to be extended to all of the signatory countries, after the identification of top-level laboratories is complete.
2. The priority topics needing particular attention and which will be the object of programmes and doctoral theses are enumerated in the Annex.
3. In view of the complex problems posed by woody material, each country is invited to promote appropriate procedures for the awarding of doctoral thesis grants and financial support that is sufficiently motivating and durable to allow new well-qualified laboratories to make a long term contribution to the work of the EUROSILVA network.
4. This dialogue would allow several laboratories of the EUROSILVA network to respond jointly to inter- national tenders. Furthermore, it would facilitate co-ordination in the choice of projects financed by each country within the framework of an overall project.

NATIONAL AND INTERNATIONAL CO-ORDINATION BODIES

1. Each country is invited to organize its national network on the basis of the principles set out in chapter 2, and to participate jointly with other countries in the international activity of the EUROSILVA net- work.
2. A chairman is chosen by the participating countries to lead the EUROSILVA network as a group and to represent the network when dealing with other bodies. Appropriate mechanisms for co-ordination of international proposals of tree physiology research, especially in the European Communities, should be used.
3. Each country is responsible for the financing of its contribution to the EUROSILVA network.



ANNEX: EUROSILVA - MAIN CURRENT TOPICS

1. Methodology

- 1.1. Plant physiological and biochemical methods are as yet little developed in the case of forest trees. Therefore appropriate methods must be newly developed or methods in use for the study of agricultural plants should be adapted for studies of tree species.
- 1.2. Some examples are:
 - 1.2.1. organogenesis and regeneration “in vitro”
 - 1.2.2. isolation and characterization of organelles, enzymes, nucleic acids and metabolites from cell cultures as well as needles, leaves, woody tissues and roots of intact trees

2. Tree Molecular Biology

- 2.1. Considerable advances have been made in recent years concerning the molecular biology of agricultural plants. Such studies are also essential for forest trees in order to understand processes of developmental regulation, of tree growth and of stress effects and for gene transfer (e.g. for insect, disease or frost resistance). Two major areas concerned are cellular membranes and differential gene expression.
- 2.2. Some examples are:
 - 2.2.1. study of gene expression at the levels of transcription and translation
 - 2.2.2. identification and mode of formation of secondary metabolites that are related to specific developmental or stress effects (e.g. phytoalexins, terpenes)

3. Tree Physiology, Ecophysiology and Biochemistry

- 3.1. There is again a wide discrepancy in knowledge on agricultural and forest plants. Physiological processes will have to be studied in close co-operation with neighbouring disciplines (forest ecology, forest pathology, tree propagation) .
- 3.2. Some examples are:
 - 3.2.1. study of germination and seed vernalization
 - 3.2.2. study of aging and of normal and premature senescence processes
 - 3.2.3. study of the light and dark reactions of photosynthesis as well as carbon transport and fixation
 - 3.2.4. study of stomatal processes, gas exchange and ecophysiology
 - 3.2.5. biosynthesis, turnover and mode of action of phytohormones
 - 3.2.6. uptake, distribution and effects of mineral ions



4. Stress and Disease Factors

- 4.1. In principle, each of the above mentioned physiological processes may be growth-determining and be involved in stress and disease phenomena. It is therefore mandatory to coordinate studies on “healthy” trees with studies on stressed or diseased ones.
- 4.2. Some examples are:
 - 4.2.1. effects of air pollutants such as ozone, nitrogen oxides, sulphur dioxide, etc...
 - 4.2.2. pathogenic organisms (e.g. viroids, viruses, bacteria, fungi), insects
 - 4.2.3. environmental factors (e.g. soil parameters, mineral nutrition, salt stress, wounding, allelochemicals)



RESOLUTION S6:

EUROPEAN NETWORK FOR RESEARCH INTO FOREST ECOSYSTEMS

THE SIGNATORY STATES AND INTERNATIONAL INSTITUTION,

deeming that the increase in knowledge and the changes in attitudes over the last two decades have permitted a clearer perception of the need to establish, on a scientific basis, an overall protection strategy for forests, which is not limited to the conservation of a small fraction of forest land,

noting that difficulties in forestry management have been encountered in certain cases, due to insufficient knowledge and understanding of the complexity of ecosystems,

considering that scientific works carried out in the framework of international collaboration, notably those under the aegis of the European Economic Community, have confirmed the fact that recently recorded damage to European forests is the result of complex interaction between natural causes and the actions of man,

conscious that a coherent ecosystem-based approach implies close collaboration between specialists from various disciplines in joint programmes, often bringing about the development of original methods for ecological analysis, in the field of forestry,

considering that it is necessary to limit ourselves to the study of a few themes of major interest, such as, for example, the hydrological cycle, the nutrition cycle and the energy cycle,

conscious that such research demands substantial financing, and that it is unlikely that each European country will be able to face a scientific challenge of this magnitude alone,



commit themselves to better combine their research efforts at the international level, on the management of forest ecosystems and, to this end, to set up a European network for research into forest ecosystems.

THE PRINCIPLES

1. In the framework of this co-operation, well-qualified teams will coordinate on themes defined in common, thus enabling the development of a real European competence, capable of elaborating concepts and works methods that will allow us to analyse problems concerning European forests, and to take into account ecosystems in all their diversity.
2. Each signatory country is invited to organize a mechanism for national co-operation, in the framework of its own appropriate structures, and then, to participate in the international activity of this network, together with the other countries.
3. The definition of a few priority research subjects particularly important for the protection of forests, and object of co-ordination within this network, is entrusted to a working group in which each signatory is represented, in liaison with the international organizations concerned, notably the International Union of Forestry Research Organizations.
4. A chairman will be chosen by the participating countries to lead the entire network and represent it before other bodies. Appropriate procedures will be set up to ensure collaboration and co-ordination with those in charge of international calls for tender in the field of research on the functioning and malfunctioning of forestry ecosystems, especially those of the European Communities.
5. Each country will finance its own contribution to this network.



RESOLUTIONS FROM THE MINISTERIAL CONFERENCE HELD IN HELSINKI (FINLAND) IN 1993.

RESOLUTION H1:

GENERAL GUIDELINES FOR THE SUSTAINABLE MANAGEMENT OF FORESTS IN EUROPE

THE SIGNATORY STATES AND THE EUROPEAN COMMUNITY,

A. Recalling that the Signatory States and the European Community have endorsed the Rio Declaration and Agenda 21 and signed the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change at the United Nations Conference on Environment and Development in June 1992 and considering that they therefore recognise the need to reconcile the legitimate and sustainable use of timber and other forest products with all other functions of forests in the ecological and social conditions prevailing in Europe, and that the conservation and appropriate enhancement of biological diversity in all types of forests is an essential element in their sustainable management,

B. Recognising the non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests, as adopted by the 1992 United Nations Conference on Environment and Development, hereafter referred to as the Statement of Forest Principles,

C. Considering the objectives of sustainable management as stated in the Statement of Forest Principles: viz. "Forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual human needs of present and future generations",



D. Agreeing that, for the purposes of this resolution, "sustainable management" means the stewardship and use of forest and other wooded lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems,

E. Acknowledging the need when implementing policies for sustainable management to take account of potential impacts of climate change on forest ecosystems,

F. Acknowledging the need to carry out sustainable forest management in accordance with national development policies and priorities and on the basis of environmentally sound national guidelines, and recognising that in the formulation of such guidelines account should be taken of internationally agreed principles relevant to the various conditions in Europe,

G. Recognising that forests provide timber as an essential product that can also, to a large extent, substitute for products from non-renewable resources, as well as provide energy and a multitude of other goods, services and functions, which will be necessary for the welfare of society and the environment for the foreseeable future,

H. Recognising that forests in Europe grow in a widely varying environment (boreal to Mediterranean, continental to maritime, alpine to lowlands), have a long history and have been influenced by human settlements and actions over centuries, leading, inter alia, to knowledge, skills and experience in forestry practices, to the development and implementation of management policies and regulations based on long-term planning, and to a fragmented ownership structure increasing in some areas, all of which factors have a bearing on the protection and sustainable management of forests in Europe,

I. Noting that the report 'The Forest Resources of the Temperate Zones' (the UN-ECE/FAO 1990 Forest Resource Assessment) shows that the European forest resource is continuing to expand in terms of area, standing volume and increment, and that the demand for non-wood products and services is increasing in absolute and relative importance,

J. Noting with concern that on average more than one fifth of the trees in Europe have in recent years shown damaged foliage, as stated in the 1992 report 'Forest Condition in Europe' by the UN/ECE International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests and the Commission of the European Communities, and that a continuation of the present pollution load for extended periods of time or an increase in pollution levels will threaten the vitality of forests over large areas of Europe,

K. Considering the adverse effects on forests in some parts of Europe of storms, inadequate management, pests, diseases, game, overgrazing and unregulated grazing, and of



inadequately planned large industrial and infrastructure development, and being concerned over the destruction of large areas of forest by fires,

L. Considering the responsibility of Europe to contribute to the sustainable management of the global forest;

commit themselves to promote:

1. The implementation of the General Guidelines set out in Part I of this resolution, these being regarded as particularly relevant to the achievement of sustainable forest management in Europe;

2. Co-operation in carrying out the Future Action set out in Part II.

PART I: GENERAL GUIDELINES

1. Human actions must be avoided which lead, directly or indirectly, to irreversible degradation of forest soils and sites, the flora and fauna they support and the services they provide. Efforts should be increased to keep the emissions of air pollutants and greenhouse gases below the expected tolerance level of forest ecosystems, taking into account the long-term cumulative and/or synergistic effects of pollutants. Forest fires and the pollution of soils must be strictly controlled and could dictate overall policy and management objectives and practices in particularly sensitive parts of Europe.

2. Forest policies, as adapted to local laws within the framework of national traditions and constitutional processes, should recognise the long-term nature of forestry by having an appropriate level of continuity in legal, institutional and operational matters and should strongly encourage practices in state and private forests which facilitate multiple functions and sustainable management, including the conservation and appropriate enhancement of biodiversity. Forest owners who provide multiple-use benefits to the community should be encouraged and supported by society or other beneficiaries, as appropriate, when such provision involves them in excessive costs.

3. Forest management should be based on stable and long-term land-use policies and regulations, which, inter alia, are aimed at conserving functional forest ecosystems and take account of the ownership structure in Europe, and which are based on the general presumption that forest land, particularly land considered natural or semi-natural, will remain dedicated to that use.

4. Forest management should be based on periodically updated plans or programmes at local, regional or national levels, as well as for ownership units, when appropriate and on forest surveys, assessments of ecological impact and on scientific knowledge and practical experience.



5. Forest management should provide, to the extent that it is economically and environmentally sound to do so optimal combinations of goods and services to nations and to local populations. Multifunctional forestry should be promoted to achieve an appropriate balance between the various needs of society.

6. Forest management practices should have due regard to the protection of areas of ecological fragility, to the conservation of primary and climax forests, areas with cultural heritage, and the landscape, to safeguarding the quality and quantity of water, and to maintaining and developing other protective functions of forests such as the protection of aquatic and agricultural ecosystems and protection against floods, erosion and avalanches.

7. Forest management practices should aim at maintaining and, if possible, improving the stability, vitality, regeneration capacity, resistance and adaptive capacity of forest ecosystems towards stresses, including their protection against fire, pests, diseases, game and other agents of damage such as overgrazing and unregulated grazing. The prevention and control of large-scale biotic and abiotic damage should be supported. Special attention should be paid to maintaining and, if needed, to improving the quality of forest soils. Silvicultural practices emulating nature should be encouraged. Practices contrary to sustainable management should be actively discouraged.

8. In the management of existing forests and the development of new forests, the chosen tree species should be well suited to local conditions and be capable of tolerating climatic and other stresses, such as insects and diseases, and potential climate changes, throughout the growing period. Genetic selection, which is commonly practised in Europe, should not favour performance traits at the expense of adaptive ones, except in particular cultures where intensive care may protect them against damage. Reforestation should be conducted in a manner that does not negatively affect ecologically interesting or noteworthy sites and landscapes.

9. Native species and local provenances should be preferred where appropriate. The use of species, provenances, varieties or ecotypes outside their natural range should be discouraged where their introduction would endanger important/valuable autochthonous ecosystems, flora and fauna. Introduced species may be used when their potential negative impacts have been assessed and evaluated over sufficient time, and where they provide more benefits than do autochthonous ones in terms of timber production and other functions. Whenever introduced species are used to replace local ecosystems, sufficient action should be taken at the same time to conserve native flora and fauna.

10. Due to the high levels of human consumption and waste common in many areas of Europe, recycling and use for energy of forest products should be encouraged both to alleviate the problem of waste disposal and to increase the potential of forest products to substitute for products from non-renewable sources.



11. Because of the expanding European forest resource, the use of wood and non-wood forest products should be encouraged on a basis compatible with the sustainable management of forests, thereby providing and increasing the potential for traditional and new forest products, sales of which can provide, for both the owner and society, a ready means of financing forest management.

12. As knowledge, skills and public opinion will affect forestry policies in Europe, public awareness and understanding of sustainable management should be promoted, and the provision, through appropriate research, of information and training to forestry experts and forest owners on the concept and on methods of implementing it should be intensified. To ensure the sustainable management of forests, a sufficient number of adequately trained and competent staff is essential

PART II: FUTURE ACTION

13. The Signatory States and the European Community commit themselves to preparing, without delay, specific national or regional guidelines and to incorporating them into their forestry plans and programmes for the implementation of the above General Guidelines, in a manner consistent with the Statement of Forest Principles, and will collaborate in the further development of these General Guidelines for the sustainable management of forests in Europe.

14. The Signatory States and the European Community will collaborate in efforts to increase reforestation, afforestation and forest preservation in Europe, in ways consistent with the above General Guidelines and the chapter in Agenda 21 on combating deforestation.

15. The Signatory States and the European Community will collaborate in order to develop common measures consistent with these guidelines that would favour the production, use and marketing of products from forests under sustainable management.

16. The Signatory States and the European Community will participate, under the aegis of the United Nations Commission on Sustainable Development, in international activities towards the preparation of a global convention on the management, preservation and sustainable development of all types of forests.

Footnotes:

1. UN-ECE/FAO: United Nations Economic Commission for Europe/Food and Agriculture Organization



RESOLUTION H2:

***GENERAL GUIDELINES FOR THE
CONSERVATION OF THE
BIODIVERSITY OF EUROPEAN
FORESTS***

***THE SIGNATORY STATES AND THE
EUROPEAN COMMUNITY,***

A. Having regard to the fact that the conservation and appropriate enhancement of biological diversity in all types of forests is an essential element for their sustainable management,

B. Recalling the definition of biological diversity agreed upon in the Convention on Biological Diversity: *viz.* "Biological diversity means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.",

C. Recalling the concept of conservation defined in the World Conservation Strategy (1980) as the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations,

D. Considering the urgent need to show respect for the evolutionary heritage of species and forest ecosystems, in order to enable the adequate genetic adaptive capacity to be safeguarded in the interest of present and future generations,

E. Considering that the combination of the direct and indirect actions of man on forests can contribute to a decrease in intraspecific variability, species diversity and ecosystem variety,

F.

Considering the objectives and measures set out in the Convention on Biological Diversity that was signed at the United Nations Conference on Environment and Development in June 1992 in Rio de Janeiro, and considering in



particular the precautionary principle in the preamble to the Convention, which notes that "where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimise such a threat",

G. Recalling that biological diversity is also the basis of genetic improvement of species and varieties of technical and economic interest,

H. Considering the general objectives and specific measures stated in the Convention concerning the Protection of the World Cultural and Natural Heritage (1972), the Convention on the Conservation of European Wildlife and Natural Habitat (1979), the Convention of Barcelona and its Protocol Concerning Mediterranean Specially Protected Areas (1982), the EC Directives concerning the Conservation of Wild Birds (1979) and the Conservation of Natural Habitats and Wild Fauna and Flora (1992), the Council of Europe's European Network of Biogenetic Reserves (1976), and the Council of Europe's Decision on Preservation of Natural Forests (1977);

commit themselves to promote:

The implementation of the following General Guidelines at the level (local, regional or national) appropriate to the exercise of their individual responsibilities in matters of forest policy, and their further development.

PART I: GENERAL GUIDELINES

1. The conservation and appropriate enhancement of biodiversity should be an essential operational element in sustainable forest management and should be adequately addressed, together with other objectives set for forests, in forestry policies and legislation.

2. The conservation and appropriate enhancement of biodiversity in forests should be based both on specific, practical, cost-effective and efficient biodiversity appraisal systems, and on methods for evaluating the impact on biodiversity of chosen forest development and management techniques.

3. Where possible, the size and degree of utilisation of forest working circles and other basic management units should take account of the scale of variation of the site, in order to better conserve and manage the diversity of habitats. Management should aim at increasing the diversity of forest habitats.

4. Where possible the establishment of taxa which are naturally associated with those that occur most frequently in the forest should be encouraged, and a variety of structure within stands should be favoured, where the natural dynamics of such associations permit.

PART II: FUTURE ACTION



5. The Signatory States and the European Community will recognise the conservation and appropriate enhancement of biodiversity as an essential element of sustainable forest management. This would mean, *inter alia*:

5.1. The conservation of genetic resources of forest taxa, both those currently exploited for economic purposes and those considered secondary or rare as detailed in Resolution 2 of the Strasbourg Conference, and

5.2. Taking account of the protection of threatened forest species and ecosystems, as listed nationally or locally, in the formulation of national forest policies.

6. The Signatory States and the European Community will establish at national or regional levels a coherent ecological network of climax, primary and other special forests aimed at maintaining or re-establishing ecosystems that are representative or threatened.

7. The Signatory States and the European Community will establish educational and public awareness programmes on the conservation of biodiversity emphasising, *inter alia*, the positive aspects of sustainable management of forests on the conservation of biodiversity. These programmes should be aimed, *inter alia*, at enabling effective participation by local communities, forest owners and Non-Governmental Organisations in the conservation and appropriate enhancement of biological diversity.

8. The Signatory States and the European Community will promote technical co-operation including exchange of experts, courses and seminars, and transfer of technology.

9. Signatory States and the European Community will develop a coherent and responsible approach to the conservation and appropriate enhancement of biodiversity in forests through the development of national or regional guidelines with the aim, *inter alia*, of:

9.1. Obtaining sufficient knowledge about the ecosystem functions and services derived from European forests,

9.2. Obtaining sufficient knowledge of the status and requirements for management of the endangered, rare or representative biotic elements of the forests, and

9.3. Achieving adequate forecasting, monitoring and evaluation of the consequences for biodiversity of different silvicultural techniques.

10. In order to attain aims 9.1., 9.2. and 9.3. the Signatory States and the European Community will implement surveys and research programmes which are specially adapted to their economic, social and environmental conditions and which are, where appropriate, co-ordinated and integrated with similar work resulting from the implementation of the relevant resolutions of the Strasbourg and Helsinki Conferences.

11. The Signatory States and the European Community will continue to improve methods for assessing biodiversity in forests and for evaluating the impact on biodiversity of forest management methods.



Footnotes:

1. Any taxonomic group

RESOLUTION H3:

FORESTRY CO-OPERATION WITH COUNTRIES WITH ECONOMIES IN TRANSITION

THE SIGNATORY STATES AND THE EUROPEAN COMMUNITY,

A. Recognising the importance of the forestry sector to Countries with Economies in Transition, in relation to the development of their political, economic and social conditions as they adjust their former centrally-planned economies to market economies,

B. Being aware of the possible consequences of the economic transformation process in the Countries with Economies in Transition for the sustainable management of forests and for forest conservation,

C. Emphasising the increasing need for broadly-based bilateral and multilateral co-operation in the forestry sector, and noting with appreciation the existing co-operation and the activities, at national, regional and interregional levels, of programmes and organisations, including the Commission of the European Community, which are involved in co-operation with Countries with Economies in Transition,

D. Emphasising the need for initiative and priority-setting by the Countries with Economies in Transition to promote European co-operation which benefits the forestry sector in general,

E. Recalling the results of the Dobris (Czechoslovakia, 1991) as well as of the Luzern (Switzerland, 1993) conferences of European environment ministers, and in particular the Environmental Action Programme for Central and Eastern Europe,

F. Being aware of the generally adverse impact on the management, preservation and sustainable development of forests in Countries with Economies in Transition arising from



air pollution, loss of biodiversity and genetic resources, fires and lowered ground water tables and, in certain areas, nuclear radiation,

G. Noting that requests have been made for assistance in the monitoring of forest resources, especially in relation to their state of health over large areas,

H. Recognising the particular importance of programmes to support Countries with Economies in Transition in their endeavour to protect their forest resources and biodiversity and the need to enhance sustainable development of their forest and forest products sector,

I. Recognising the human and natural potentials within the Countries with Economies in Transition and the importance of the existing co-operation between them;

commit themselves to promote and support co-operation for mutual benefits, within the framework of the following General Guidelines, in order to provide relevant expertise and advice, and to invite appropriate organisations and institutions to do likewise.

PART I: GENERAL GUIDELINES

1. Countries with Economies in Transition should be encouraged to promote actions for the sustainable management of forest resources, in conformity with the General Guidelines developed in the resolutions of the Helsinki Ministerial Conference.
2. The Signatory States and the European Community should support and complement these actions, based on the principle of partnership and taking into account the needs, priorities and commitments of the Countries with Economies in Transition themselves.
3. Co-operation may take the form of transfer of knowledge, and of bilateral and multilateral projects, and should focus on technical, scientific, institutional and legal matters.
4. Within bilateral contacts, twinning arrangements should be promoted between institutions such as universities, vocational schools and research institutes as well as between individuals.
5. Co-operation should be further developed in particular in the following areas: strengthening of institutions, development of the legal and policy framework for the sustainable development of forestry and the forest products sector; and, in this context, activities to support the development of market oriented and ecologically sound enterprises.
6. Adequate assessments of forest resources and of environmental impacts should take place before initiating co-operation projects which are likely to have major consequences for the transboundary environment, in accordance with the ECE Convention on Environmental Impact Assessment in a Transboundary Context (1991).



7. Countries should develop, by mutual co-operation, information exchange and monitoring systems related to transboundary factors causing forest damage and forest decline, such as air pollution, fires, nuclear radiation, game and others; and should cooperate in preventing and combatting damage from such harmful agents.
8. Where co-ordination of multilateral co-operation initiatives is necessary, this should be done by existing institutions.

PART II: FUTURE ACTION

9. The member countries of the ECE, FAO, UNEP, UNDP, World Bank and EBRD, as well as the European Community, and the international Non-Governmental Organisations should consider activities aiming at promoting progress in the topics mentioned in the General Guidelines.
10. The Signatory States and the European Community will promote the transfer of knowledge, bilateral and/or multilateral contacts, mutually beneficial joint research projects and the preparation of national forest programmes.
11. The Signatory States and the European Community will promote professional contacts, the transfer and publication of information, documentation and professional literature, exchanges of experts and students, educational workshops, seminars, conferences, training courses and other forms of education, with the participation of groups of specialists from Countries with Economies in Transition and from European countries with market economies.
12. The Signatory States and the European Community agree to support existing efforts aimed at promoting the development of the national forestry databases of Countries with Economies in Transition and their linkage to existing European databases.

1. Reference list, not exclusive:

ICP Forests: International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests

ECE: Economic Commission for Europe

FAO: Food and Agriculture Organization

UNDP: United Nations Development Programme

UNEP: United Nations Environment Programme

GEF: Global Environment Facility

IUFRO: International Union of Forestry Research Organizations

EBRD: European Bank of Reconstruction and Development



RESOLUTION H4: STRATEGIES FOR A PROCESS OF LONG-TERM ADAPTATION OF FORESTS IN EUROPE TO CLIMATE CHANGE THE SIGNATORY STATES AND THE EUROPEAN COMMUNITY,

A. Recognising that human activities are substantially increasing the atmospheric concentrations of greenhouse gases, and thus altering the composition of the atmosphere,

B. Recognising that the increase in concentrations of greenhouse gases in the atmosphere enhances the natural greenhouse effect, which in turn will result, on average, in an additional warming of the Earth's surface and lower atmosphere, and that the emissions of chlorofluorocarbons (CFCs) and other ozone depleting compounds in the atmosphere are causing a considerable decrease in the concentration of ozone in the stratosphere, and also tropospheric ozone is inducing phytotoxic effects,

C. Appreciating that natural forest ecosystems of Europe have adapted, during long periods of evolutionary development, to the climatic conditions now prevailing,

D. Appreciating that rotations of forest stands in Europe can be considerably longer than the likely time in which anthropogenic climate change will have an effect on forest ecosystems,

E. Whereas these changes in the composition of the Earth's atmosphere and consequent changes in climate are likely to have, within the time span of one rotation of a forest stand, both favourable and adverse effects on forest ecosystems in Europe, which may include:

E.1. Reduced vitality, stability and regeneration of trees and forests, more favourable conditions for harmful insects and pathogens, and increased risks of forest fires and storms,

E.2. Increased mineralisation of organic matter, which will release carbon dioxide, increase soil leaching, affect soil processes, and lead to eutrophication of waters,



E.3. Altered ground water tables and soil moisture regimes, due to shifts in the balance of precipitation and evapotranspiration or due to sea level rise, which may cause stress and reduced vitality and pest and disease resistance in trees, and

E.4. Increased growth of forest vegetation which is likely to occur, for a certain time and provided no soil changes adversely affect this, as a result of increases in CO₂ in the atmosphere leading to sequestration of carbon,

F. Recognising the complexity of interactions between climate and ecosystems, including fSSBCack processes, and the present limited understanding of the ranges, flexibility of adaptation and acclimatisation mechanisms of these ecosystems,

G. Recognising the present limited ability to predict and assess the net outcome of favourable and adverse effects,

H. Recognising that changes in the atmosphere may also affect human activities, such as the management of watersheds and coastal zones, agriculture, etc., and that any large-scale change in these activities will also affect the forestry sector,

I. Recognising that altered water use caused by changing and adapting forest ecosystems in hydrological catchments may have an impact on water resource planning,

J. Recognising that measures taken within the forestry sector can contribute to the mitigation of climate change only if the existence and health of forest ecosystems is assisted of by a sufficient reduction in emissions of harmful substances such as acidifying compounds, nitrogen compounds, and release of greenhouse gases,

K. Considering it necessary to initiate a process of long-term adaptation and adjustment of forests and the forestry sector in Europe to climate change by means of research and other actions that are compatible with the aims and objectives of the United Nations Framework Convention on Climate Change and the Convention on Biological Diversity, as well as other relevant international legal instruments,

L. Noting the activities of large international programmes such as IGBP and WCP, and recognising the task of IPCC within WMO and UNEP and other relevant international and regional/sub-regional organisations to assess the impact of climate change;

commit themselves to support appropriate measures for the mitigation of climate change and the limitation of greenhouse gas emissions, as provided for in the United Nations Framework Convention on Climate Change, and further

to support national and international research into, and to enhance international co-operation on, the following subjects:

- € the impact of possible climate change on forest ecosystems and forestry
- € the possible adaptation of forest ecosystems and forestry to climate change



- € the mitigation of the adverse effects of climate change by forest ecosystems and forestry in Europe,

and for that purpose identify the following specific areas for research and future action.

PART I: AREAS FOR RESEARCH

1. Greater understanding through research of the linkages between climate change and forest ecosystems, including fSSBCacks from the ecosystem to the climate system.
2. Studies on the role of forests, forest soils, and peatlands in Europe as reservoirs, sinks and sources of carbon, in order to understand the role of European forests in global fluxes, especially in the global carbon cycle. Research in this field may include the development of common methodologies for research and for national and regional inventories and the development and maintenance of databases on a European scale on reservoirs, sinks and sources of carbon in terrestrial ecosystems.
3. Studies on genetic variability of regionally important tree species in response to changes in climate and increased concentration of carbon dioxide, and on the degree and rate of evolutionary processes and adaptation, by means of genetic changes.
4. Studies on the dynamic equilibrium of host-parasite relationships in new climatic environments.
5. Studies on soil formation processes, including the mineralisation of organic matter and leaching, in response to climate change.
6. Development of process-based predictive ecosystem models applicable to the European scale, and which may be used in comprehensive ways to integrate anticipated changes in the climate and their interaction with air pollution, with their effects on forest ecosystems and the fluxes of greenhouse gases and with their effects on different forest management systems.
7. Studies on the adjustment of European forest management systems in order to optimise adaptation to climate change, to ensure the health and multiple functions of existing forests, and to optimise the sequestration and storage of carbon.

PART II: FUTURE ACTION

8. The Signatory States and the European Community will intensify research and international co-operation carried out by existing organisations and working groups dealing with the research areas mentioned above.
9. The Signatory States and the European Community will review, develop and coordinate the present monitoring schemes to assess more effectively those large-scale patterns and dynamics of alterations that may be due to climate change in



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European forest ecosystems. These tasks should be carried out in co-ordination with existing European networks of permanent sample **points**.

10. The Signatory States and the European Community will promote the utilisation, with low emission technology, of wood as a renewable energy source, and, in so doing, contribute to the sustainable development of forests by protecting the environment and mitigating the greenhouse effect.

1. IGBP: International Geosphere-Biosphere Programme

WCP: World Climate Programme

IPCC: Intergovernmental Panel on Climate Change

WMO: World Meteorological Organization

UNEP: United Nations Environment Programme



RESOLUTIONS FROM THE MINISTERIAL CONFERENCE HELD IN LISBON (PORTUGAL) IN 1998.

GENERAL DECLARATION OF THE THIRD MINISTERIAL CONFERENCE ON THE PROTECTION OF FORESTS IN EUROPE

We, the Ministers responsible for Forests, at the Third Ministerial Conference on the Protection of Forests in Europe, held in Lisbon, 2-4 of June 1998, recalling the forest-related decisions and agreements of UNCED⁽¹⁴³⁾, UNGASS⁽¹⁴⁴⁾ and XI World Forestry Congress as well as the provisions of the United Nations Conventions, CBD⁽¹⁴⁵⁾, FCCC⁽¹⁴⁶⁾ and CCD⁽¹⁴⁷⁾; recognising the progress and achievements made in the implementation of the commitments of the Strasbourg and Helsinki Ministerial Conferences; and being aware of the many challenges, opportunities as well as threats related to forests and sustainable forest management, share the following Vision:

In the 21st century, the European forest sector, while respecting the social, economic, environmental and cultural functions of forests, will optimise its contribution to the sustainable development of society, especially to the development of rural areas, the provision of renewable resources and the protection of the global and local environment.

Society, understanding the multiple roles of forests and recognising the importance of the conservation and sustainable management of forests, will support a sound development of the forest sector by providing conducive regulatory, institutional, economic and social frameworks for practising sustainable forest management, taking informed decisions on the

⁽¹⁴³⁾ UNCED - United Nations Conference on Environment and Development

⁽¹⁴⁴⁾ UNGASS - United Nations General Assembly Special Session

⁽¹⁴⁵⁾ CBD - Convention on Biological Diversity

⁽¹⁴⁶⁾ UN/FCCC - United Nations Framework Convention on Climate Change

¹⁴⁷ CCD - Convention to Combat Desertification



best possible use of wood and non-wood forest products and services, and reducing existing strains on forest health and vitality.

An effective partnership between society and the forest sector will be strengthened, recognising the role of forests as a key renewable resource, the responsibility of forest owners in their sustainable management, and the responsibility of Europe in demonstrating the integration of all forest functions and in the innovative harvesting of wood and non-wood forest products and services.

The heritage of healthy and biologically diverse forests for future generations, the positive contribution to the global carbon and hydrological cycles, the protection of soil and water resources, the protection of population and infrastructures against natural risks, the creation of income and employment particularly in rural areas and the excellence for providing recreational and cultural values for all people, are characteristics associated with forests on which generations of forest owners and society in general have built and will continue to build present and future values.

In the spirit of the above vision, we declare our commitment to :

1. Enhance the social and economic elements of sustainable forest management and strengthen the links between the forest sector and society by increasing dialogue and mutual understanding on sustainable forest management and the role of forests and forestry. Develop to their full value the potential contributions from the forest sector to rural development, employment, environment and to overall sustainable development of society by implementing the Resolution L1, 'People, forests and forestry – Enhancement of the Socio-economic aspects of sustainable forest management'.
2. Further promote sustainable forest management contributing, inter alia, to the conservation of biological diversity, to the mitigation of the negative effects of air pollution and climatic change, and to the combat of the desertification, by:
 - I. Adopting the six Pan-European criteria for sustainable forest management, endorsing, implementing, while continually improving the Pan-European indicators for sustainable forest management' and endorsing the voluntary 'Pan-European Operational Level Guidelines for Sustainable Forest Management', by implementing the Resolution L2, 'Pan-European criteria and indicators and operational guidelines for sustainable forest management';
 - II. Collaborating with the Ministerial process 'Environment for Europe', especially through endorsing the 'Work-Programme on the Conservation and Enhancement of Biological and Landscape Diversity in Forest Ecosystems 1997-2000', promoting its



implementation and future revision, in line of resolution H2⁽¹⁴⁸⁾ and the proposals for action agreed at the United Nations Intergovernmental Panel on Forests;

- III. Taking action to stimulate and promote the sound use of wood and other forest based products as environmentally friendly and renewable materials;
- IV. Evaluating the role of forest ecosystems to the mitigation of climatic change, in line with the United Nations Framework Convention on Climate Change, as a carbon sink and reservoir, combined with growing use of long life-cycle timber products and enhancing the multiple contributions of forest ecosystems to the conservation and enrichment of soils and for the regulation of water cycles.
 3. Taking national as well as co-operative actions towards the implementation of the decisions of the United Nations General Assembly Special Session (UNGASS) concerning the proposals for action agreed at the ad-hoc Intergovernmental Panel on Forests (IPF) and contributing to the work of the Intergovernmental Forum on Forests under the United Nations Commission on Sustainable Development (UNCSD/IFF).
 4. Continue to share the results obtained in the Pan-European process with all interested parties and in all important international *fora*, within and outside the United Nations system, and thereby contributing positively with our experience and achievements to promote sustainable forest management at all levels, to build consensus on forest policy issues and to the implementation of the important political commitments and agreements.
 5. Develop a programme of work to implement the decisions of this Conference and to reinforce the implementation of previous commitments made at Strasbourg and Helsinki Ministerial Conferences, in collaboration with international bodies and organisations, in particular FAO⁽¹⁴⁹⁾ European Forestry Commission, UNECE⁽¹⁵⁰⁾ Timber Committee, UNEP⁽¹⁵¹⁾, ILO⁽¹⁵²⁾, NGO's⁽¹⁵³⁾ and other relevant stakeholders. This programme will be based on scientific and technical co-operation in Europe, providing a dynamic approach to problem solving in European forestry.
 6. Pursue within the spirit that presided Strasbourg and Helsinki Ministerial Conferences, reaffirming the principles agreed for the implementation of the decisions taken by the Conferences and continuation of the Ministerial process. Further Conferences should be convened when considered necessary by a sufficient number of Signatory States and progress in implementing commitments has been made at national and regional levels.
 7. Actively work towards consensus building on the need and possible elements of a global legally binding instrument on the management, conservation and sustainable development of

⁽¹⁴⁸⁾ 'H2'- Helsinki Resolution 2 'General guidelines for the conservation of the biodiversity of European forests'

⁽¹⁴⁹⁾ FAO - Food and Agriculture Organisation of the United Nations

⁽¹⁵⁰⁾ UNECE - United Nations Economic Commission for Europe

⁽¹⁵¹⁾ UNEP - United Nations Environmental Programme

⁽¹⁵²⁾ ILO - International Labour Organisation

⁽¹⁵³⁾ NGO's - Non-Governmental Organisations



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all types of forests within the work of UNCSD/IFF, recalling our firm commitment to such an instrument.



RESOLUTION L1

PEOPLE, FORESTS AND FORESTRY: ENHANCEMENT OF SOCIO-ECONOMIC ASPECTS OF SUSTAINABLE FOREST MANAGEMENT

THE SIGNATORY STATES AND THE EUROPEAN COMMUNITY,

- A. Recalling the objectives of sustainable forest management as stated in the forest principles⁽¹⁵⁴⁾ adopted by the United Nations Conference on Environment and Development (UNCED)⁽¹⁵⁵⁾ and recalling the definition of sustainable forest management adopted at the Helsinki Ministerial Conference in Resolution H1⁽³⁾,
- B. Recognising the significant role of the forest sector and sustainable forest management in the overall sustainable development of society,
- C. Recognising the importance of the social and economic functions of forests together with the environmental, ecological and cultural functions as essential elements for sustainable forest management, and the need to address these in order to positively respond to increasing and sometimes conflicting demands of society,
- D. Aware of the need for an increasing dialogue between the forest sector and the general public to define widely accepted objectives for forest policy,
- E. Affirming that forests and forestry constitute one of the main pillars of sustainable rural development and recognising the complementarity between forestry and other sectors for sustainable development,
- F. Aware of the contribution of the forest sector in most European countries as a source of direct and indirect employment, and the potential to generate new job and income opportunities mainly in rural areas in such diverse businesses as non-traditional small scale industry, other forest related activities such as recreation and eco-tourism, and other emerging ventures,

⁽¹⁵⁴⁾ *Forest principles – ‘Non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests’*

⁽²⁾ *“Forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual human needs of present and future generations”*

⁽³⁾ *‘Sustainable management’ means the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national and global levels, and that does not cause damage to other ecosystems.*



- G. Recalling that sound and adequate regulatory, institutional and economic frameworks are important for practising sustainable forest management,
- H. Recalling that forest management in Europe, relies on millions of private owners as well as on the activities of state bodies and other public structures with long traditions and rights,
- I. Emphasising the renewable and environmentally friendly nature of wood and non-wood forest products from forests under sustainable management, and that development of proper assessment and valuation methods are needed for the non-marketed forest goods and services,
- J. Acknowledging the valuable contribution of the FAO/ECE/ILO⁽¹⁵⁶⁾ Team of Specialists on Social Aspects of Sustainable Forest Management, notably through the report “People, Forests and Sustainability“;

commit themselves to promote:

- 1. The implementation of the General Guidelines and Future Actions set out in this resolution;
- 2. The exchange of experience and co-operation in carrying out the future actions of Part II within Europe through existing international organisations and institutions.

PART I: GENERAL GUIDELINES

- 1. The interaction between forestry and society in general, should be promoted through partnerships, and be strengthened by raising general awareness of the concept of sustainable forest management and the role of forests and forestry in sustainable development. Therefore an adequate level of participation, education, public relations and transparency in forestry is needed.
- 2. Sound regulatory, institutional and economic frameworks should be maintained and improved at national level, conducive to enabling and motivating all forest owners to practice sustainable forest management and to make long term investments in forestry.
- 3. Structures of co-operation, particularly organisations of forest owners, should be encouraged in their development and capacity to reinforce sustainable forest management practices and to facilitate *inter alia*, information flow, production and marketing of products and services, including new and hitherto non-marketed forest products and services.
- 4. The contribution of forestry to sustainable rural development should be fully utilised through the coherence of forest policies and programmes and activities in other sectors, such as agriculture, tourism, environment, energy and industry taking advantage of complementarities and synergies.

⁽¹⁵⁶⁾ FAO - Food and Agriculture Organisation of the United Nations, ‘ECE’ United Nations Economic Commission for Europe and ‘ILO’ International Labour Organisation



5. The marketed and non-marketed cultural, social and environmental services of forests should be assessed and their contributions to society and sustainable rural development should be integrated in the overall policies and programmes of the forest and other sectors.
6. New employment and income opportunities in sustainable forestry should be stimulated notably through diversification of activities related to forests.
7. Human resources development policies should stimulate the adaptation to changing job opportunities related to forests, broaden the competence of forest owners and managers and forest labourers, and to strive to offer equal opportunities in employment, income, training and careers.
8. Gender aspects in European forestry and their potential in further development of sustainable forest management should be recognised and fully utilised.
9. The production, marketing and consumption of wood and other forest products and services from forests under sustainable management, a key renewable resource, should be actively promoted as a means for improving the economic viability of forest management, taking advantage of the new market opportunities.

PART II: FUTURE ACTIONS

The Signatory States and the European Community, commit themselves to:

1. Develop, at adequate levels, a dialogue with the public and efficient programmes to increase awareness of the benefits of sustainable management for society.
 2. Continue to develop the conditions for the participation of relevant stakeholders in the development of forest policies and programmes.
 3. Explore ways and means to maintain and develop at national level sound regulatory, institutional and economic frameworks conducive to enabling and motivating all forest owners to practice sustainable forest management and to make long term investment in forestry.
 4. Adapt education and training systems and programmes contributing to the development of a highly skilled, multidisciplinary workforce, also enhancing the involvement of women in forest related activities.
 5. Encourage studies on gender aspects of forest policy and practices in Europe especially in the context of education, training, communication and decision making to improve sustainable forest management.
 6. Promote the development of education and training programmes, especially directed to forest owners and managers, focusing on new opportunities and techniques for the production of goods and services from forests under sustainable management.
 7. Encourage comparative studies of wood and non-wood substitutes, considering their complete life-cycles and strive for conditions favourable for the production, marketing and consumption of wood and other products and services from forests under sustainable
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management, as viable alternatives to competing products using non-renewable natural resources, generating more employment and income.

8. Promote the improvement and application of appropriate safety and health standards and practices, professionalism of forest owners, forest workers, and contractors, and skills certification.
9. Engage further research efforts on the socio-economic aspects of sustainable forest management, in particular on the assessment and valuation of the full range of forest goods services, in order to provide reliable information for policy and decision making and public dialogue.
10. Promote the incorporation of the results of assessment and valuation of wood and non-wood forest goods and services into national economic and natural resource accounting systems.
11. Evaluate the potential impacts of quality assurance systems and programmes such as voluntary and independent forest certification systems on sustainable forest management in the line of the proposals for action agreed by the Intergovernmental Panel on Forests (IPF).



RESOLUTION L2:

***PAN EUROPEAN CRITERIA,
INDICATORS AND OPERATIONAL
LEVEL GUIDELINES FOR
SUSTAINABLE FOREST MANAGEMENT***

***THE SIGNATORY STATES AND THE
EUROPEAN COMMUNITY,***

- A. Recalling the resolutions adopted at the Helsinki Ministerial Conference, namely in Resolution H1 ‘General Guidelines for the Sustainable Management of Forests in Europe’ and Resolution H2 ‘General Guidelines for the Conservation of the Biodiversity of European Forests’, and noting that pan-European criteria, indicators and operational level guidelines for sustainable forest management are based on Resolutions H1 and H2,
 - B. Acknowledging the co-operative work between the European countries and organisations in the formulation of criteria, describing the different aspects of sustainable forest management in Europe; through quantitative and descriptive indicators the development of a coherent set of tools to assess and assist further progress in sustainable forest management, at the international and national levels; and, guidelines for practical use on a voluntary basis at operational level,
 - C. Noting that criteria and indicators are potentially useful tools in promoting sustainable forest management by providing relevant information for forest policy development and evaluation, national forest policies, plans and programmes and as a basis for cross-sectoral forest related data collection,
 - D. Noting that the pan-European operational level guidelines, despite their voluntary nature, can contribute to improved communication, awareness building and implementation of appropriate action at the practical level for sustainable forest management when adapted to the specific conditions of the implementation level,
 - E. Aware of the need to refine and improve these pan-European tools as the concept of sustainable forest management evolves, technical and scientific knowledge improves and relevant international agreements are developed,
 - F. Recognising the effort made and progress achieved by European and other countries and international organisations to expand the development and use of criteria and indicators for sustainable forest management,
-



- G. Acknowledging the contacts and co-operation with other international and regional processes and initiatives, as well as international organisations, for the development and implementation of criteria and indicators, and emphasising the importance to continue the co-operation to promote comparability among the various sets of criteria and indicators,
- H. Acknowledging the collaboration with UNECE⁽¹⁵⁷⁾ and FAO⁽¹⁵⁸⁾, and particularly the support given in data collection by inclusion of most of the existing pan-European quantitative indicators in the temperate and boreal component of the Forest Resource Assessment (FRA) Programme.

have decided to:

1. Adopt the six criteria for sustainable forest management from the ‘Pan-European Criteria and Indicators for Sustainable Forest Management’ (Annex 1) and endorse the associated indicators as a basis for international reporting and for development of national indicators;
2. Proceed to implement, continuously review and further improve the associated indicators;
3. Endorse the ‘Pan-European Operational Level Guidelines for Sustainable Forest Management’ (Annex 2) as a framework of recommendations for sustainable forest management for practical use on a voluntary basis.

and commit themselves to:

1. Promote the development and implementation of national criteria and indicators using the Pan-European criteria and indicators as a reference framework, and taking into account specific country conditions and integrate them into national forest programmes or other relevant policy frameworks.
2. Improve the quality and promote the necessary adaptations of national data collection systems, to fulfil the needs of information for national and international reporting on sustainable forest management recognising the need for continuity of terms and definitions.
3. Use to the extent possible the criteria and indicators in international reporting on the status and conditions of European forests. Also call upon the UNECE, FAO and other relevant organisations to consider whether their regular international reporting, particularly the Forest Resource Assessment (FRA) Programme, could take into account the most updated criteria and indicators.
4. Encourage national and international research institutes to evaluate the consistency, relevance and cost effectiveness of indicators in assessing sustainable forest management, as well as availability of national data. Together with governments and organisations, identify needs, promote and support necessary co-operative research to improve and better

¹⁵⁷ UNECE - United Nations Economic Commission for Europe.

¹⁵⁸ FAO - Food and Agriculture Organisation of the United Nations.



assess the multiple functions and uses of forests which are considered as being insufficiently covered by the existing set of criteria and indicators.

5. Evaluate, at a national level, the development over time in measurable indicators with respect to the agreed developed objectives in order to assess progress made in sustainable forest management.
6. Engage efforts with other international and regional processes and initiatives, FAO, UNEP⁽¹⁵⁹⁾ and other relevant international organisations as well as conventions, to further elaborate common definition of key terms and concepts, as well as methodologies for data collection, storage and dissemination in order to enhance comparability of the different sets of criteria and indicators for sustainable forest management.
7. Encourage the adaptation of the ‘Pan-European Operational Level Guidelines for Sustainable Forest Management’ to the specific national, sub-national and local economic, ecological, social and cultural conditions, with participation of the interested parties.
8. Disseminate the ‘Pan-European Operational Level Guidelines for Sustainable Forest Management’ or equivalent existing national standards in line with the guidelines, to the forest owners, forest managers, forest organisations, general public, and other interested parties, and encourage their voluntary use.

Annexes:

- (1) Pan-European Criteria and Indicators for Sustainable Forest Management
- (2) Pan-European Operational Level Guidelines for Sustainable Forest Management

⁽¹⁵⁹⁾ UNEP - United Nations Environmental Programme



ANNEX 1 OF RESOLUTION L2 PAN-EUROPEAN CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT

***ADOPTED BY THE EXPERT LEVEL FOLLOW-UP
MEETINGS OF THE HELSINKI CONFERENCE IN
GENEVA, JUNE 24, 1994 AND IN ANTALYA, JANUARY
23, 1995***

**CRITERION 1: MAINTENANCE AND APPROPRIATE ENHANCEMENT OF
FOREST RESOURCES AND THEIR CONTRIBUTION TO GLOBAL CARBON
CYCLES**

CONCEPT AREA: GENERAL CAPACITY

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

provides an overall policy framework for conservation and sustainable management of forests

2 Existence and capacity of an institutional framework to:

###provide guidelines for national plans or programmes

3 Existence of economic policy framework and financial instruments, and the extent to which it:



###permits the flow of capital in and out of the forest sector in response to market signals and public policy decisions

4 Existence of informational means to implement the policy framework, and the capacity to:

###recognise the full range of forest values and potentials with periodic forest-related planning and assessment of national forest resources

CONCEPT AREA: LAND USE AND FOREST AREA

Quantitative indicator:

1.1. Area of forest and other wooded lands and changes in area (classified, if appropriate, according to forest and vegetation type, ownership structure, age structure, origin of forest)

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###maintains forest resources and prevents forest degradation;

###clarifies property rights and provides for appropriate land tenure arrangements

2 Existence and capacity of an institutional framework to:

###carry out integration between land-use planning and forest management

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###supports mechanisms promoting integration between land-use planning and forest management planning

4 Existence of informational means to implement the policy framework, and the capacity to:

###conduct and apply management guidelines for land-use planning in relation to forest resources###enhance conversion of agricultural land and other areas without tree cover to forest land by afforestation



CONCEPT AREA: GROWING STOCK

Quantitative indicator:

1.2.Changes in:

- a. total volume of the growing stock
- b.mean volume of the growing stock on forest land (classified, if appropriate, according to different vegetation zones or site classes)
- c. age class or appropriate diameter classes

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###

supports sustainable management while increasing the growing stock of both marketable and non-marketable tree species on timber yielding forests and other wooded lands.

2 Existence and capacity of an institutional framework to:

###undertake and develop regular assessment of forest resources

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###provides appropriate incentives to support forest policy aiming at bigger growing stock

4 Existence of informational means to implement the policy framework, and the capacity to:

###

improve execution of forest resources assessment by acknowledged research institution or other similar organisations

CONCEPT AREA: CARBON BALANCE

Quantitative indicator:

1.3. Total carbon storage and, changes in the storage in forest stands

Descriptive indicators (examples):



1 Existence of a legal / regulatory framework, and the extent to which it:

###clarifies policies for enhancing the use of forest products for energy

2 Existence and capacity of an institutional framework to:

###

develop programmes for enhancing the use of forest products for energy

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###provides subventions for the use of wood for energy

4 Existence of informational means to implement the policy framework, and the capacity to:

###enhance studies on the length of the life cycle of wood products

###enhance effectively organised collection of waste paper

CRITERION 2: MAINTENANCE OF FOREST ECOSYSTEM HEALTH AND VITALITY

Quantitative indicators:

2.1. Total amount of and, changes over the past 5 years in depositions of air pollutants (assessed in permanent plots).

2.2. Changes in serious defoliation of forests using the UN/ECE and EU defoliation classification (classes 2, 3, and 4) over the past 5 years.

2.3. Serious damage caused by biotic or abiotic agents:

- a. severe damage caused by insects and diseases with a measurement of seriousness of the damage as a function of (mortality or) loss of growth
- b. annual area of burnt forest and other wooded land
- c. annual area affected by storm damage and volume harvested from these areas
- d. proportion of regeneration area seriously damaged by buck and other animals or by grazing

2.4. Changes in nutrient balance and acidity over the past 10 years (pH and CEC); level of saturation of CEC on the plots of the European network or of an equivalent national network

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:



###

enforces laws and policies related to maintaining forest health and vitality

2 Existence and capacity of an institutional framework to:

###

develop mechanisms for controlling the occurrence of serious damages / damage agents

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###creates appropriate incentives to prevent extreme disruption of ecological processes

4 Existence of informational means to implement the policy framework, and the capacity to:

###strengthen regular field monitoring on forest health status and inventories of soil acidification

###prevent serious damage caused by machinery and forestry operations: compaction of soil, injuries into standing trees, etc.

CRITERION 3: MAINTENANCE AND ENCOURAGEMENT OF PRODUCTIVE FUNCTIONS OF FORESTS (WOOD AND NON-WOOD)

CONCEPT AREA: TIMBER HARVESTING

Quantitative indicators:

3.1. Balance between mean increment and the volume of fellings over the past 10 years

3.2. Percentage of forest area managed according to a management plan or management guidelines.

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###encourages forest owners to practice environmentally sound forestry based on a forest management plan or equivalent guidelines

2 Existence and capacity of an institutional framework to:



###develop institutions and mechanisms advocating economic, environmental and social factors as essential elements in timber harvesting

###develop and maintain efficient physical infrastructure to facilitate the delivery of forest products and services

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###supports investment and taxation policies which recognise the long-term nature of investments in forestry

###supports non-discriminatory trade policies for forest products

4 Existence of informational means to implement the policy framework, and the capacity to:

###improve technologies and plans based on proper forest inventories

CONCEPT AREA: NON-WOOD PRODUCTS

Quantitative indicator:

3.3. Total amount of and changes in the value and/or quantity of non-wood forest products (e.g., hunting and game, cork, berries, mushrooms, etc.)

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it

###provides legal instruments to regulate forest management practices for recreation and the harvesting of important non-wood forest products

2 Existence and capacity of an institutional framework to:

###support appropriate organisations for extension services on non-wood benefits

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###

enables the implementation of guidelines for management of non-wood products

4 Existence of informational means to implement the policy framework, and the capacity to:

###develop management plans for non-wood products



CRITERION 4: MAINTENANCE, CONSERVATION AND APPROPRIATE ENHANCEMENT OF BIOLOGICAL DIVERSITY IN FOREST ECOSYSTEMS

CONCEPT AREA: GENERAL CONDITIONS

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###clarifies the concept of management, conservation and sustainable development of forest

###provides for national adherence to international legal instruments

2 Existence and capacity of an institutional framework to:

###maintain, conserve and appropriately enhance biological diversity at the ecosystem, species and genetic levels

###identify economic value in forests whose management is adjusted in favour of maintaining biological diversity

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###creates new resources and incentives to enhance the mechanisms for predicting impacts of human interventions on forests

###supports economic value in forests whose management is adjusted in favour of maintaining biological diversity

4 Existence of informational means to implement the policy framework, and the capacity to:

###develop new inventories and ecological impact assessments on biological diversity

###develop tools to assess the effects of forest management on biological diversity

CONCEPT AREA: REPRESENTATIVE, RARE AND VULNERABLE FOREST ECOSYSTEMS

Quantitative indicator:



Changes in the area of:

- a. natural and ancient seminatural forest types
- b. strictly protected forest reserves
- c. forests protected by special management regime

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###provides for legal instruments to protect representative, rare or vulnerable forest ecosystems

2 Existence and capacity of an institutional framework to:

###develop and maintain institutional capacity and distribution of responsibilities related to protected areas

###maintain degree of implementation of confirmed national forest conservation programmes

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###supports the representativeness of protected forests in relation to ecological and regional distribution

4 Existence of informational means to implement the policy framework, and the capacity to:

###enhance measures to re-establish the endemic biological diversity in forests managed for production

###apply measures for rehabilitation of degraded forest areas

CONCEPT AREA: THREATENED SPECIES

Quantitative indicator:





4.2. Changes in the number and percentage of threatened species in relation to total number of forest species (using reference lists e.g., IUCN, Council of Europe or the EU Habitat Directive)

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###

provides for legal instruments to protect threatened species

2 Existence and capacity of an institutional framework to:

###

develop and maintain institutional instruments to protect threatened species

3 Existence of economic policy framework and financial instruments, and the extent to which it:

supports implementation of management guidelines to take into account threatened species

4 Existence of informational means to implement the policy framework, and the capacity to:

construct periodically reviewed lists of threatened forest species

enhance level of knowledge on threatened species / assessments, inventories or research on threatened species

CONCEPT AREA: BIOLOGICAL DIVERSITY IN PRODUCTION FORESTS

Quantitative indicators:

4.3. Changes in the proportions of stands managed for the conservation and utilisation of forest genetic resources (gene reserve forests, seed collection stands, etc.); differentiation between autochthonous and introduced species

4.4. Changes in the proportions of mixed stands of 2-3 tree species

4.5. In relation to total area regenerated, proportions of annual area of natural regeneration



Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###provides for legal instruments to ensure regeneration of managed forests

2 Existence and capacity of an institutional framework to:

###develop and maintain institutional instruments to ensure regeneration of managed forests

###conduct inventories on proportion of area covered by trees significantly older than the acceptable age of harvesting currently used

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###provides for economic incentives for taking account of environmental issues in management planning

###

conducts inventories / assessments on bioindicators

4 Existence of informational means to implement the policy framework, and the capacity to:

###take measures to maintain or to re-establish biological diversity in old forests

###monitor changes in the proportions of afforested or reforested areas covered by autochthonous and introduced species, conifer and broadleaved species

CRITERION 5: MAINTENANCE AND APPROPRIATE ENHANCEMENT OF PROTECTIVE FUNCTIONS IN FOREST MANAGEMENT (NOTABLY SOIL AND WATER)

CONCEPT AREA: GENERAL PROTECTION

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###provides for legal instruments to regulate or limit forest management practices in forests protected for infrastructure / protection forests



2 Existence and capacity of an institutional framework to:

###develop and maintain institutional instruments to regulate or limit forest management practices in forests protected for infrastructure / protection forests

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###supports the preparation of management guidelines for infrastructure and protection forests

4 Existence of informational means to implement the policy framework, and the capacity to:

###

conduct research on infrastructure and protection forests in relation to land use practices / forest management

CONCEPT AREA: SOIL EROSION

Quantitative indicator:

5.1. Proportion of forest area managed primarily for soil protection

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###provides for legal instruments to regulate or limit forest management practices in areas with vulnerable soils

2 Existence and capacity of an institutional framework to:

###strengthen institutional instruments to regulate or limit forest management practices in areas with vulnerable soils

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###supports the preparation of management guidelines for areas with vulnerable soils

4 Existence of informational means to implement the policy framework, and the capacity to:

###conduct inventories and research on soil erosion



CONCEPT AREA: WATER CONSERVATION IN FORESTS

Quantitative indicator:

5.2. Proportion of forest area managed primarily for water protection

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###provides for legal instruments to regulate or limit forest management practices in favour of water conservation or protection of water resources

2 Existence and capacity of an institutional framework to:

###develop and maintain institutional instruments to regulate or limit forest management practices in favour of water conservation or protection of water resources

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###supports the preparation of management guidelines for taking into consideration water conservation in forest management practices

4 Existence of informational means to implement the policy framework, and the capacity to:

###conduct inventories and research on water quality and flow characteristics in relation to land use practices / forest management

CRITERION 6: MAINTENANCE OF OTHER SOCIO-ECONOMIC FUNCTIONS AND CONDITIONS

CONCEPT AREA: SIGNIFICANCE OF THE FOREST SECTOR

Quantitative indicator:

6.1. Share of the forest sector from the gross national product

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###

provides for legal instruments to ensure development of the forest sector



2 Existence and capacity of an institutional framework to:

###develop and maintain efficient physical infrastructure to facilitate the supply of forest products

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###ensures new investments in the forest sector to meet future demands

4 Existence of informational means to implement the policy framework, and the capacity to:

###develop and put into practice new improved technology

###conduct market analysis to better fulfil the needs of society

CONCEPT AREA: RECREATIONAL SERVICES

Quantitative indicator:

6.2. Provision of recreation: area of forest with access per inhabitant, % of total forest area

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###recognises customary and traditional rights of indigenous people, and provides means of resolving access disputes

2 Existence and capacity of an institutional framework to:

###undertake planning and assessment in recreational services on forest

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###supports forestry constituencies to conserve special environmental, cultural, social and scientific values in relation to recreational services

4 Existence of informational means to implement the policy framework, and the capacity to:



###conduct assessment on recreation

CONCEPT AREA: PROVISION OF EMPLOYMENT

Quantitative indicator:

6.3. Changes in the rate of employment in forestry, notably in rural areas (persons employed in forestry, logging, forest industry)

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###provides for legal instruments for securing income levels in forest sector

2 Existence and capacity of an institutional framework to:

###develop and maintain human resource skills in all relevant tasks

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###

supports programmes to ensure employment in rural areas in relation to forestry

4 Existence of informational means to implement the policy framework, and the capacity to:

###secure a fair share of income from non-wood products coming from rural sources of income

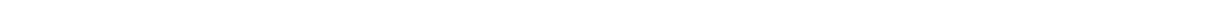
CONCEPT AREA: RESEARCH AND PROFESSIONAL EDUCATION

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###provides for national programmes for research and professional education

2 Existence and capacity of an institutional framework to:





###develop and maintain institutional instruments to enhance forest related research and education

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###provides public and private funding for research, educational and extension programmes

4 Existence of informational means to implement the policy framework, and the capacity to:

###guarantee a sufficient number of people educated at different levels of forestry and cross-cutting field of education

CONCEPT AREA: PUBLIC AWARENESS

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

###

provides opportunities for public access to information

2 Existence and capacity of an institutional framework to:

###strengthen organisations to provide extension services for general public

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###guarantees that part of forest revenues are reinvested in informing the public about forests

4 Existence of informational means to implement the policy framework, and the capacity to:

###

support teaching and informing of environmental issues and other forestry related subjects

CONCEPT AREA: PUBLIC PARTICIPATION

Descriptive indicators (examples):



1 Existence of a legal / regulatory framework, and the extent to which it:

###provides opportunities for public participation in public policy and decision making on forests

2 Existence and capacity of an institutional framework to:

###

enforce institutional mechanisms for the involvement of local people and NGOs in decision-making

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###

attracts public outreach and preparatory planning

4 Existence of informational means to implement the policy framework, and the capacity to:

###enhance public participation in decision-making processes related to implementation of forest policy

CONCEPT AREA: CULTURAL VALUES

Descriptive indicators (examples):

1 Existence of a legal / regulatory framework, and the extent to which it:

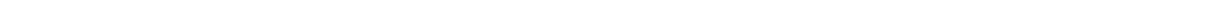
###provides for programmes and management guidelines which recognise cultural heritage in relation to forestry

2 Existence and capacity of an institutional framework to:

###develop and maintain programmes to conserve culturally valuable sites and landscapes

3 Existence of economic policy framework and financial instruments, and the extent to which it:

###provides for sufficient financial incentives for acknowledgement of cultural values in forest management planning





4 Existence of informational means to implement the policy framework, and the capacity to:

###conduct studies on proportion of culturally valuable sites and sites with special visual value.



PAN-EUROPEAN OPERATIONAL LEVEL GUIDELINES FOR SUSTAINABLE FOREST MANAGEMENT

The Operational Level Guidelines form a common framework of recommendations that can be used on a voluntary basis and as a complement to national and/or regional instruments to further promote sustainable forest management at the field level, on forest areas in Europe.

Adopted at the Expert Level

**Fifth Expert Level Preparatory Meeting of the Lisbon
Conference on the Protection of Forests in Europe
27-29 April, 1998, Geneva Switzerland**

1. INTRODUCTION

Forests in Europe grow in a wide and diverse range of ecological conditions, from boreal to Mediterranean and from alpine to lowlands. These forests have been influenced by human settlement and action over the centuries, and in some countries reforestations constitute a major part of the resource. Forest management in Europe is characterized by a large proportion of private, fragmented, small-scale farm-related ownership structures in the majority of countries, as well as a large proportion of public forests and forests owned by private forest enterprises in others.

Forest management takes place within clearly established ownership rights and with a long history of national/regional laws and regulations based on long-term planning. Thus, the concept of sustainability has a long tradition in forestry in Europe. However, the meaning of “sustainable forest management” has developed over time according to the changing needs of society. Originally, sustainability in forest management was mainly considered as the



sustained yield of timber to cope with historic wood shortages. However, the importance of other multiple functions of forests have gradually been incorporated in forest management. During the 1980's the concern about the deterioration of forests throughout Europe led to an increasing awareness of the economic, ecological, social and cultural values of forests by the broader public. Nowadays many important aspects of sustainable forest management are covered by national and/or regional laws and regulations and are already being regularly monitored.

The wish for a concerted effort at a political level to protect and further improve the sustainable management of European forests led to the First Ministerial Conference on the Protection of Forests in Europe held in Strasbourg in 1990. At the Second Ministerial Conference, held in Helsinki in 1993, the ministers responsible for forestry in Europe embraced the internationally accepted UNCED¹⁶⁰ Forest Principles, taking a further step in the history of the concept of sustainable forest management by adopting, *inter alia*, Resolution H1 “General Guidelines for Sustainable Management of European Forests” and Resolution H2 “General Guidelines for the Conservation of the Biodiversity of European Forests”. These General Guidelines represent the political commitment of the signatory states of the Helsinki Resolutions by providing a general policy direction and a long-term goal to meet the demands on European forests for multiple goods and services in a manner that is consistent with their sustainable management, and conservation and enhancement of their biological diversity.

A new, common definition of “sustainable forest management” was laid down in Resolution H1:

“the stewardship and use of forests and other wooded lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems”.

For the follow up and the implementation of the General Guidelines, the pan-European national level criteria and indicators¹⁶¹ were adopted at the expert level within the Follow-Up Process of the Helsinki Ministerial Conference in 1994. They are a policy instrument for evaluating and reporting progress towards sustainable forest management, as described in Resolution H1, in individual European countries and in Europe as a whole.

The six pan-European criteria for sustainable forest management are:

1. Maintenance and appropriate enhancement of forest resources and their contribution to global carbon cycles;

¹⁶⁰ United Nations Conference on Environment and Development, Rio de Janeiro, 1992.

¹⁶¹ **Criteria** characterise or define the essential elements or set of conditions or processes by which sustainable forest management may be assessed. The direction of change within each criterion is shown by periodically measured **indicators**.



2. Maintenance of forest ecosystem health and vitality;
3. Maintenance and encouragement of productive functions of forests (wood and non-wood);
4. Maintenance, conservation and appropriate enhancement of biological diversity in forest ecosystems;
5. Maintenance and appropriate enhancement of protective functions in forest management (notably soil and water); and
6. Maintenance of other socio-economic functions and conditions.

The Pan-European Operational Level Guidelines have been elaborated to further promote sustainable forest management in Europe by translating the international commitments down to the level of forest management planning and practices. They represent a common framework of recommendations for reference at the field level that can be used on a voluntary basis. These Guidelines are directly based on Resolutions H1 and H2, and they follow the structure of the six pan-European criteria that were identified as the core elements of sustainable forest management. For clarity they are divided into “Guidelines for Forest Management Planning” and “Guidelines for Forest Management Practices”, focusing on basic ecological, economical and social requirements for sustainable forest management within each criterion.

The Pan-European Operational Level Guidelines are designed to be applied in the context of, and in full respect to, national and/or regional instruments and actions. They cannot be used in isolation to determine sustainability in forest management. Their purpose is to identify complementary actions at the operational level which will further contribute to sustainability of forest management. This should reflect national, economic, ecological, social and cultural conditions, research and traditional knowledge, and must respect forest and environmental legislation, decisions on protected areas, other general principles, as well as codes for forest practice such as standards used for forest management in any given country.

The effective implementation of these Guidelines implies recognizing the major role and the legal rights of forest owners. Furthermore, the implementation of sustainable forest management in the field requires continuous extension, training and education of forest managers, owners and workers, for which the Pan-European Operational Level Guidelines can provide an important reference.

2. POTENTIAL USES OF THE PAN-EUROPEAN OPERATIONAL LEVEL GUIDELINES

In general, the Pan-European Operational Level Guidelines are designed for sub-national applications at a practical level. Whenever used, their content should be adapted to the specific local, economic, ecological, social and cultural conditions, as well as to the respective forest management and administrative systems already in place; in this process



participation of all interested parties should be encouraged. Therefore, all guidelines may not necessarily be relevant for all levels, all types of forest, or ownership categories.

In order to facilitate the implementation of these voluntary Guidelines, there might be a need for the promotion and equitable support by government, society and other beneficiaries to create and maintain a sound balance of interests including a sound economic basis for forestry.

The potential applications and users of the Pan-European Operational Level Guidelines are:

€ *Forest managers and forest owners*

The Guidelines can assist forest managers and forest owners in planning and implementing improved sustainable management practices and operations in forest and other wooded lands. They can be used for increasing communication and awareness in relation to the evolving concept of sustainable forest management and the desired actions at the operational level amongst forest owners, managers, employees, contractors or others.

€ *Sub-national organisations*

The sub-national (regional or local) organisations can use the guidelines as a reference tool in informing and advising forest owners and forest managers, in planning the practices and/or in supervising their implementation. These types of organisations include, for example, sub-national administrative forestry organisations and forest owners or management associations.

€ *National/governmental decision makers*

The Guidelines can be used as an internationally agreed framework for the guidance of forest management bringing the commitments made in the international policy *fora* (UNCED Forest Principles and Helsinki Resolutions) down to the field level. They can serve as a reference for setting codes for forest practice and forest management planning.

€ *International forest dialogue*

The Guidelines form a European reference to the global forest dialogue. They can contribute, as an instrument representing consensus within the Pan-European Process, to the achievement of further consensus on sustainable management of all types of forests on a global scale.



≠ Communication tools and certification systems

These guidelines can serve as a tool to improve communication and awareness building related to sustainable forest management. In addition, although certification and other quality assurance systems or programmes as such would remain independent from the Pan-European Process and are voluntary to the interested parties, the Guidelines could provide an indicative reference for the establishment of standards for those systems.



3. PAN-EUROPEAN OPERATIONAL LEVEL GUIDELINES FOR SUSTAINABLE FOREST MANAGEMENT

CRITERION 1. MAINTENANCE AND APPROPRIATE ENHANCEMENT OF FOREST RESOURCES AND THEIR CONTRIBUTION TO GLOBAL CARBON CYCLES

1.1 Guidelines for Forest Management Planning

- a. Forest management planning should aim to maintain or increase forest and other wooded lands, and enhance the quality of the economic, ecological, cultural and social values of forest resources, including soil and water. This should be done by making full use of related services such as land-use planning and nature conservation.
- b. Inventory and mapping of forest resources should be established and maintained, adequate to the local and national conditions, and in correspondence with the topics described in these Guidelines.
- c. Management plans or their equivalents, appropriate to the size and use of the forest area, should be elaborated and periodically updated. They should be based on legislation as well as existing land use plans, and adequately cover the forest resources.
- d. Monitoring of the forest resources and evaluation of their management should be periodically performed, and their results should be fed back into the planning process.

1.2 Guidelines for Forest Management Practices

- a. Forest management practices should safeguard the quantity and quality of the forest resources in the medium and long term by balancing harvesting and growth rates, and by preferring techniques that minimise direct or indirect damage to forest, soil or water resources.
- b. Appropriate silvicultural measures should be taken to maintain the growing stock of resources at - or bring to - a level that is economically, ecologically and socially desirable.
- c. Conversion of abandoned agricultural and treeless land into forest land should be taken into consideration, whenever it can add economic, ecological, social and/or cultural value.



CRITERION 2. MAINTENANCE OF FOREST ECOSYSTEM HEALTH AND VITALITY

2.1 Guidelines for Forest Management Planning

- a. Forest management planning should aim to maintain and increase the health and vitality of forest ecosystems and to rehabilitate degraded forest ecosystems, whenever this is possible by silvicultural means.
- b. Health and vitality of forests should be periodically monitored, especially key biotic and abiotic factors that potentially affect health and vitality of forest ecosystems, such as pests, diseases, overgrazing and overstocking, fire, and damage caused by climatic factors, air pollutants or by forest management operations.
- c. Forest management plans or their equivalents should specify ways and means to minimise the risk of degradation of and damages to forest ecosystems. Forest management planning should make use of those policy instruments set up to support these activities.

2.2 Guidelines for Forest Management Practices

- a. Forest management practices should make best use of natural structures and processes and use preventive biological measures wherever and as far as economically feasible to maintain and enhance the health and vitality of forests. Adequate genetic, species and structural diversity should be encouraged and/or maintained to enhance stability, vitality and resistance capacity of the forests to adverse environmental factors and strengthen natural regulation mechanisms.
- b. Appropriate forest management practices such as initial and subsequent reforestations with tree species and taxa that are suited to the site conditions or the use of felling, hauling off, and transport techniques that minimise tree and/or soil damages should be applied. The spillage of oil through forest management operations or the indiscriminate disposal of waste on forest land should be strictly avoided.
- c. The use of pesticides and herbicides should be minimised, taking into account appropriate silvicultural alternatives and other biological measures.
- d. In case fertilisers are used they should be applied in a controlled manner and with due consideration to the environment.



CRITERION 3. MAINTENANCE AND ENCOURAGEMENT OF PRODUCTIVE FUNCTIONS OF FORESTS (WOOD AND NON-WOOD)

3.1 Guidelines for Forest Management Planning

- a. Forest management planning should aim to maintain the capability of forests to produce a range of wood and non-wood forest products and services on a sustainable basis.
- b. Forest management planning should aim to achieve sound economic performance taking into account possibilities for new markets and economic activities in connection with all relevant goods and services of forests.
- c. Forest management plans or their equivalents should take into account the different uses or functions of the managed forest area. Forest management planning should make use of those policy instruments set up to support the production of marketable and non-marketable forest goods and services.

3.2 Guidelines for Forest Management Practices

- a. Forest management practices should be ensured in quality with a view to maintain and improve the forest resources and to encourage a diversified output of goods and services over the long term.
- b. Regeneration, felling, and hauling operations should be carried out in time, and in a way that do not reduce the productive capacity of the site, for example by avoiding damage to polewood and old growth trees as well as to the forest soil, and by using appropriate systems.
- c. Harvesting levels of both wood and non-wood forest products should not exceed a rate that can be sustained in the long term, and optimum use should be made of the harvested forest products, with due regard to nutrient offtake.
- d. Adequate infrastructure, such as tracks, hauling roads or bridges should be planned, established and maintained to ensure efficient delivery of goods and services while at the same time minimising negative impacts on the environment.



CRITERION 4. MAINTENANCE, CONSERVATION AND APPROPRIATE ENHANCEMENT OF BIOLOGICAL DIVERSITY IN FOREST ECOSYSTEMS

4.1 Guidelines for Forest Management Planning

- a. Forest management planning should aim to maintain, conserve and enhance biodiversity on ecosystem, species and genetic level and, where appropriate, diversity at landscape level.
- b. Forest management planning and terrestrial inventory and mapping of forest resources should include ecologically important forest biotopes, taking into account protected, rare, sensitive or representative forest ecosystems such as riparian areas and wetland biotopes, areas containing endemic species and habitats of threatened species, as defined in recognised reference lists, as well as endangered or protected genetic in situ resources.



4.2 Guidelines for Forest Management Practices

- a. Natural regeneration should be preferred, provided that the conditions are adequate to ensure the quantity and quality of the forests resources and that the existing provenance is of sufficient quality for the site.
- b. In initial and subsequent reforestations, origins of native species and local provenances that are well adapted to site conditions should be preferred, where appropriate. Only those introduced species, provenances or varieties should be used whose impacts on the ecosystem and on the genetic integrity of native species and local provenances have been evaluated, and if negative impacts can be avoided or minimised.
- c. Forest management practices should, where appropriate, promote a diversity of both horizontal and vertical structures such as uneven-aged stands and the diversity of species such as mixed stands. Where appropriate, the practices should also aim to maintain and restore landscape diversity.
- d. Traditional management systems that have created valuable ecosystems, such as coppice, on appropriate sites should be supported, when economically feasible.
- e. Harvesting operations should be conducted in a way that do not cause lasting damage to ecosystems. Wherever possible, practical measures should be taken to improve or maintain biological diversity.
- f. Infrastructure should be planned and constructed in a way that minimises damage to ecosystems, especially to rare, sensitive or representative ecosystems and genetic reserves, and that takes threatened or other key species - in particular their migration patterns - into consideration.
- g. With due regard to management objectives, measures should be taken to balance the pressure of animal populations and grazing on forest regeneration and growth as well as on biodiversity.
- h. Standing and fallen dead wood, hollow trees, old groves and special rare tree species should be left in quantities and distribution necessary to safeguard biological diversity, taking into account the potential effect on health and stability of forests and on surrounding ecosystems.
- i. Special key biotopes in the forest such as water sources, wetlands, rocky outcrops and ravines should be protected or, where appropriate, restored when damaged by forest practices.



CRITERION 5. MAINTENANCE AND APPROPRIATE ENHANCEMENT OF PROTECTIVE FUNCTIONS IN FOREST MANAGEMENT (NOTABLY SOIL AND WATER)

5.1 Guidelines for Forest Management Planning

- a. Forest management planning should aim to maintain and enhance protective functions of forests for society, such as protection of infrastructure, protection from soil erosion, protection of water resources and from adverse impacts of water such as floods or snow slides
- b. Areas that fulfil specific and recognised protective functions for society should be registered and mapped, and forest management plans or their equivalents should take full account of these areas.

5.2 Guidelines for Forest Management Practices

- a. Special care should be given to silvicultural operations on sensitive soils and erosion-prone areas as well as on areas where operations might lead to excessive erosion of soil into watercourses. Inappropriate techniques such as deep soil tillage and use of unsuitable machinery should be avoided on such areas. Special measures to minimise the pressure of animal population on forests should be taken.
- b. Special care should be given to forest management practices on forest areas with water protection function to avoid adverse effects on the quality and quantity of water resources. Inappropriate use of chemicals or other harmful substances or inappropriate silvicultural practices influencing water quality in a harmful way should be avoided.
- c. Construction of roads, bridges and other infrastructure should be carried out in a manner that minimises loose soil exposure, avoids land slide into watercourses and that preserve the natural level and function of water courses and river beds. Proper road drainage facilities should be installed and maintained.



CRITERION 6. MAINTENANCE OF OTHER SOCIO-ECONOMIC FUNCTIONS AND CONDITIONS

6.1 Guidelines for Forest Management Planning

- a. Forest management planning should aim to respect the multiple functions of forests to society, have due regard to the role of forestry in rural development, and especially consider new opportunities for employment in connection with the socio-economic functions of forests.
- b. Property rights and land tenure arrangements should be clearly defined, documented and established for the relevant forest area. Likewise, legal, customary and traditional rights related to the forest land should be clarified, recognised and respected.
- c. Adequate public access to forests for the purpose of recreation should be provided taking into account the respect for ownership rights and the rights of others, the effects on forest resources and ecosystems, as well as the compatibility with other functions of the forest.
- d. Sites with recognised specific historical, cultural or spiritual significance should be protected or managed in a way that takes due regard of the significance of the site.
- e. Forest managers, contractors, employees and forest owners should be provided with sufficient information and encouraged to keep up to date through continuous training in relation to sustainable forest management.

6.2 Guidelines for Forest Management Practices

- a. Forest management practices should make the best use of local forest related experience and knowledge, such as of local communities, forest owners, NGOs and local people.
- b. Working conditions should be safe, and guidance and training in safe working practice should be provided.
- c. Forest management operations should take into account all socio-economic functions, especially the recreational function and aesthetic values of forests by maintaining for example varied forest structures, and by encouraging attractive trees, shrubs and other features such as colours, flowers and fruits. This should be done, however, in a way and to an extent that does not lead to serious negative effects on forest resources, and forest land.



APPENDIX X: INTERNATIONAL CONFERENCE ON CONSERVATION AND SUSTAINABLE USE OF MEDITERRANEAN FORESTS.

FINAL DECLARATION

The Declaration of Principles on forests at the 1992 Earth Summit in Río de Janeiro acknowledged the global nature of the all aspects relating to forests. These principles must be the basis for management regulations applied to ally types of forests in developed and developing countries.

Following the Earth Summit, a Ministerial Conference was held on the protection of European forests in Helsinki (June 1993) and Lisbon (June 98), where guidelines were drafted on sustainable management of European forests and the conservation of their biological diversity. There are other international agreements (Biodiversity, Desertification, Climate Change), relating to forests along with a series of international and multilateral institutions and bodies which work in these fields, as well as a wide range of reports calling for the approval of global management strategies including the one presented by David E. Thomas to the European Parliament.

To date, however, “Mediterranean forest,” a term that includes the forest ecosystems in the Mediterranean basin, whether or not they have a fully stocked tree cover, have lacked a Conservation and Sustainable Usage Strategy and a permanent forum for information and exchanges of experiences.

The members of the International Conference on Conservation and Sustainable use of Mediterranean forested areas therefore undertake to participate in the initiative taken by the Regional Government of Andalucía in holding this meeting and

DECLARE THAT:

In the course of history, people have used the resources provided by nature for their sustenance and progress. For centuries, natural resources were considered to be inexhaustible and used with the only limitations being access to tools and transport. This intemperate exploitation led to the degradation of many areas . In the 18th century, a few voices began to raise the alarm at the uncontrolled destruction of our resources. However, it was not until relatively recently when, provoked by the demographic explosion and the industrial revolution, natural resources began to be exploited to the point of exhaustion or simply destruction. This situation is of particular concern in the Mediterranean basin, where the



antiquity of the civilization and its particular ecological conditions, with prolonged summer droughts and frequent torrential rains, make its vegetation formations –grouped under the generic term of “Mediterranean forest,” especially vulnerable to disturbance and overexploitation of its resources.

In this context, particularly over the last three decades, there has been an ever-stronger call for the conservation of natural resources and their preservation for future generations. These voices, initially raised by technical, scientific and environmentalist groups, whose pioneering role must be justly acknowledged, have made a profound mark on society, as reflected in the number of meetings of world leaders including the Río Summit as the maximum expression of humanity’s concern for the environment.

Initially, this process led to very strong conservationist positions against unlimited developmentalism, which was sought to be overcome in order to reconcile the interests of conservation and harvesting through sustainable development.

This situation did coexist, however, with the type of sustainable management practised by certain local communities with their forest resources, along with certain privately owned sectors.

The rural Mediterranean world has its own idiosyncratic features that have been moulded fundamentally by the shortage and irregular supply of water resources, in which drought periods coincide with peak temperatures, leading to a very low level of productivity except in irrigated areas.

In the course of history, the increase in the rural population has produced the degradation of vast areas due to resource overexploitation and inappropriate transformations, but it has also led to magnificent production systems such as *dehesas* (grazing forests) where the mixed agricultural-forestry-livestock systems are a model that should be promoted. In addition to the *dehesas*, there are many other well-conserved areas thanks to their remoteness and inaccessibility.

The preservation of our forests cannot be tackled without the consideration of the rural population. Mediterranean forest areas still maintain a substantial population density which, to varying degrees and in accordance with each zone or country, depends on the forest resources. In many cases, this is still a subsistence relationship through the direct use of raw materials while in others, the forested areas have become generators of new goods and services demanded by an increasingly urbanised society. Rural communities should receive the value-added benefits deriving from these goods and services in order to enable them to attain a dignified standard of living that will help to prevent the depopulation of these less favoured areas.

Today, long-term rural development policies should include the necessities and benefits of Mediterranean forested areas. In addition, conservation policies must include the



rational harvesting of forest resources based on good Mediterranean silviculture and silviculture-livestock grazing practices, in order to contribute to the welfare of the rural populations, particularly considering that a large part of the present valuable ecosystems are the result of human action, without which they would be in danger of disappearing.

In a world of scarce resources and growing population, all available resources must be mobilised without permitting this mobilisation to lead to their destruction or degradation.

The world production system requires profound transformations to make a drastic reduction in its impact on the environment, and it also requires a natural environment that can provide it with goods and services that contribute to an improvement in the population's standard of living while remaining compatible with its preservation for future generations.

The efficient solution to these problems requires the adoption of policies on conservation, restoration, education, social participation and harmonious, rational and sustainable development.

These proposals are particularly appropriate for the Mediterranean Region. The participants at this Conference therefore present the following

CONSIDERATIONS:

1.- Mediterranean forest has certain ecological features that distinguish them from the forest ecosystems of other non-Mediterranean biogeographic regions. They have significantly higher levels of biodiversity diversity, and their conservation is essential to ensure the maintenance of this biodiversity.

2.- Mediterranean forest plays a fundamental and irreplaceable role in soil conservation and regulation of the water cycle, cushioning the devastating effects of torrential rains. Forest management is a vital element in the response to the objectives of the Convention on the Fight Against Desertification.

3.- Mediterranean forest has been, are and should continue to be an essential part of the economy and society. This role must be improved in the future. In certain cases, financial incentives should be provided to stimulate the participation of rural communities. The necessary financial, scientific and technological support should be provided by the Regional and international institutions.

4.- Mediterranean forest permits the development of sustainable management models which provide the best guarantee of their conservation.

5.- Resource overexploitation or the inappropriate transformation of forest land in abandoned unprofitable farmland has led to the degradation of large areas of the Mediterranean basin. These areas must be restored, avoiding and correcting the desertification processes and the loss of biodiversity.



6.- It is necessary to promote the development and application of a standardised accounting system for multiple use forest systems which take into account commercial production as well as the evaluation of externalities produced by Mediterranean forest ecosystems.

7.- Mediterranean forested areas have regained an essential role for society as a provider of new goods and services, while not overlooking the fact that in many areas their traditional usage is still essential for the subsistence of the population as well as the conservation of their biodiversity and landscape.

8.- Mediterranean forested areas are closely linked to the history and culture of Mediterranean countries, particularly their rural populations.

9.- Wise management of Mediterranean forest and its managed harvesting are indispensable for a model of development rural that ensures a dignified standard of living for their inhabitants- an essential requirement for their conservation, which can only be guaranteed to the extent that the population drainage trend is halted.

10.- The conservation and, where necessary, the restoration of Mediterranean forested areas are important sources of employment, particularly in economically less favoured zones where there are few if any alternative occupations.

11.- It is necessary to establish policies for the conservation and rational usage of the resources of Mediterranean forested areas within the European Union framework. They must be made a priority in the structural policies of rural development rural and development co-operation as elements working towards cohesion and solidarity in the Mediterranean area.

12.- Forested zones on the southern coast of the Mediterranean basin have particular conditions which distinguish them from those to the north. Intensive usage of forest resources by local groups has produced heavy degradation, making restoration, preservation and sustainable management initiatives an urgent priority.

13.- It is necessary to reconcile the interests of protection and production in Mediterranean forested areas in order to achieve their conservation, the rational usage of their resources, a maximum level of well-being for their societies as a whole, and their preservation for future generations.

14.- Mediterranean forested areas have a very low level of economic productivity while on the other hand, they are highly profitable in social, cultural and environmental benefits for society as a whole. This makes it essential for governments to safeguard the general interest and at the same time, provide public funds to ensure their preservation and, where necessary, their restoration.



15.- While it is necessary to preserve all forest stands, the restoration of many areas of deforested land is imperious. This restoration is a specific challenge for Mediterranean silviculture, which will make a decisive contribution in the context of the global environmental problems and provide a guarantee for the future.

16.- The vegetation models are the result of long processes of adaptation to numerous environmental factors. The use of allochthonous or unsuitable genotypes that may harm the adaptability of the local ecotypes and the natural evolution of the ecosystems must be avoided. Forest restoration should never be to the detriment of other non-forest communities.

17.- The planning and management of Mediterranean forest requires the use of the appropriate indicators to their ecological, economic and social characteristics, to their use at the different decision-making levels and for the purpose of accompanying and demonstrating good management practice.

In the light of the above circumstances, we **DECLARE**:

That it is indispensable to preserve the social, economic, environmental and cultural values of Mediterranean forests by creating the right conditions to guarantee their sustainable management. It is therefore necessary to:

I.- Design a Strategy for the Conservation and Sustainable Use of Mediterranean Forests which, in the light of the idiosyncrasies of each region and country, must establish the management models for the ecosystems in the Mediterranean basin and the maximum benefits to be gained in harmony with the maintenance of biodiversity and its preservation for future generations.

II.- Formulate and refine silviculture-grazing patterns which can optimise the sustained harvesting of the Mediterranean systems, guaranteeing the maintenance of their diversity and biological functions, ensuring widespread appreciation of their products and services both within and outside the commercial sphere.

III.- Include the distinctive features of Mediterranean forested areas in forestry policies and strategies, ensuring that they carry their due weight in the rural development and environment policies as an essential part of the structuring and territorial cohesion process in the Mediterranean basin.

IV.- Tackle energetically the restoration of unproductive degraded areas to endow them to future generations in an acceptable state, ensuring the genetic stability of the natural biological components of Mediterranean forest.

V.- Provide the forest development programmes with the appropriate financial resources at a national and Community level, as well as within the framework of bilateral and multilateral co-operation, while also promoting an innovative mobilisation of private funds, with special consideration given to the non-commercial services provide by forests.



Spanish Forestry Strategy

VI.- Use co-operation instruments amongst the Mediterranean countries via the appropriate rural and environmental development policies to ensure the conservation of forested areas and avoid the implementation of indiscriminate tree plantation programmes due to a lack of alternatives and a need for subsistence.

VII.- Co-operate at the Mediterranean level to empower the observation, evaluation and inventory of natural resources, particularly forests, facilitating information exchange based on new technology, encouraging training initiatives and establishing the appropriate communication strategies at a national and international level, as well as in and outside the forestry industry.

VIII.- Pay particular attention to the conservation and understanding of the arid areas of the Mediterranean basin.

IX.- Ultimately, all public authorities at the local, regional, national and international levels should contribute actively to ensure the conservation and sustainable use of Mediterranean forest, giving their plans and programmes the necessary technical, scientific and financial resources.

WE THEREFORE AGREE TO:

I.- Promote the efficient operation of a permanent forum for the exchange of information and experiences in the areas of production, preservation and restoration of Mediterranean forest, with the participation of all interested institutions and bodies, and strengthen the role of Silva Mediterranean, extending its scope to all Mediterranean countries.

II.- Support the regular convening of International Conferences on Conservation and Sustainable Use of Mediterranean forest areas.

III.- Invite the established international institutions, organizations and forums to participate actively in the preservation and sustainable use of Mediterranean forest.

IV.- Support all projects which contribute to the conservation, restoration and sustainable development of Mediterranean forest, particularly those on the southern side of the basin.

V.- Invite the European Union institutions to consider the Mediterranean forest areas as an essential element of rural development and environment policies, and to recognise them as an indispensable factor in the regional development and cohesion policies in the less favoured regions as well as in development co-operation with the non-Community Mediterranean countries.



Finally,

As host of this Conference, the Government of the Autonomous Community of Andalucía shall take it upon itself to transfer this document and the conclusions of each of the workshops to the Authorities of the participant countries and regions, as well as to the international bodies, institutions and forums related to the issue, and implement the exchange of information amongst them.

31 October 1998
