

**26th Meeting of the EFC Working Party on the Management of Mountain
Watersheds**

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**NATIONAL REPORT 2006-2007
SPAIN**

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1. Hydrological and forest restoration activities.

The General State Administration and the Autonomous Communities collaborate in activities and actions regarding hydrological and forest restoration of watersheds to control water erosion.

The following actions have been performed during the two-year period of 2006-2007:

Reforestation

Reforestation has taken place using species of the highest ecological value possible given the climate, topography and soil conditions; it was financed by the Ministry for the Environment and carried out by the Technical Services of the Autonomous Communities over a total surface area of 4,182 hectares, equalling €17,689,684.

Fig. 1. 11-year reforestation of *Populus alba*. Basque Country. **Fig. 2.** 9-year reforestation of *Prunus avium*. La Rioja.

Repairs

Repairs have been performed on flood basins and watercourses as an immediate active defence in order to reduce the possibility of water carrying and dragging solids, so that it is not prevented from merging into the riverbeds and reservoir network. This has meant the construction of 20,622 m³ of berms and dikes made of hydraulic masonry and gabions, equalling €3,914,845.

Treatments for the improvement of forest areas

In order to maintain and improve the good silvicultural state of the protective plant cover, these treatments have been applied to a total surface area of 6,183 hectares, equalling €16,214,232.

A large part of the work mentioned above has been co-financed by funds from the European Union's EAGGF-Orientation, under the current forestry guidelines of EU Regulation 1257/99 and within the framework of the corresponding Operational Programmes.

Distribution of the investments made corresponding to the actions mentioned above is shown in the following table by Autonomous Communities:

INVESTMENTS, YEARS 2006-2007	
AUTONOMOUS REGION	INVESTMENT MADE €
Andalusia	5,658,453
Aragon	5,136,300
Asturias	1,335,268
Balearic Islands	900,084
Canary islands	1,163,408
Cantabria	855,575
Castilla-La Mancha	3,342,044
Castilla y Leon	5,745,887
Catalonia	1,805,987
Extremadura	3,575,828
Galicia	1,709,660
Madrid	719,724
Murcia	2,352,318
La Rioja	1,215,928
Valencia	2,681,297
TOTAL.....	38,197,761

The breakdown of the investments by type of action referred to in the previous table is quantified in physical units in the following table:

ACTIONS IN YEARS 2006-2007			
AUTONOMOUS REGION	REFORESTATIONS (ha.)	SILVICULTURAL TREATMENTS (ha.)	HYDRAULIC ENGINEERING (m³)
Andalusia	342	1265	515
Aragon	580	299	3
Asturias	283	167	0
Balearic Islands	0	42	0
Canary islands	3	0	4,911
Cantabria	142	0	0
Castilla-La Mancha	147	746	7,073
Castilla y Leon	941	846	0
Catalonia	174	108	0
Extremadura	414	1608	0
Galicia	308	128	0
Madrid	0	96	0
Murcia	0	555	8,120
La Rioja	0	323	0
Valencia	848	0	0
TOTAL	4182	6183	20,622

Most of the 2006-2007 investment was co-financed by the EAGGF-O, with returning percentages of between 50 and 75%, depending on the area, within the framework of the Operational Programmes corresponding to the 2000-2006 period (Chapter VIII of EC Regulation 1257/99).



Fig. 3. Stabilisation dike made of gabions

As well as these routine expenditures, a series of emergency action intended to prevent and restore the damage caused by forest fires was also taken through

legislation enacted to this effect in 2005 (Royal Decree-Law 11/2005, Royal Decrees 949/2005 and 1123/2005).

The geographical distribution of these extraordinary investments is the following:

LOCATION	TYPE OF ACTION	INVESTMENT (€)
Cazorla (Jaén)	Restoration of area destroyed by forest fires	1,600,000
Lanjarón (Granada)	id.	700,000
Cangas de Nancea (Asturias)	id.	204,000
Barlovento (Las Palmas)	id.	760,000
Sevilleja (Toledo)	id.	740,000
Obejo (Cordoba)	id.	1,530,000
Peralta de Calasanz (Huesca)	id.	571,000
Torre Arcas (Teruel)	id.	558,000
El Hierro (Canary Islands)	id.	487,000
La Gomera (Canary Islands)	id.	350,000
Tenerife (Canary Islands)	id.	8,939,069
Gran Canaria (Canary Islands)	id.	9,440,969
Mohedas de la Jara (Toledo)	id.	560,000
L'Alcalaten (Castellón)	id.	2,148,300
TOTAL Ecological and environmental restoration of areas destroyed by forest fires		52,944,516
Ebro Hydrographic Confederation	Prevention of forest fires	965,000
Duero Hydrographic Confederation	id.	965,000
Guadiana	id.	880,000
Jucar	id.	274,000
Segura	id.	244,000
Tajo	id.	508,000
TOTAL Prevention of forest fires		3,836,000
El Hierro (Canary Islands)	Flood restoration	4,398,000
OTHER SUPPLEMENTARY EMERGENCY ACTIONS		1,593,000
TOTAL EMERGENCY ACTIONS		62,771,516

Aid for Public Forests

A series of subsidies have been granted for the sustainable management of public forests. These are preferably centred upon land located in mountainous areas and basin heads and have the basic aim of maintaining and enhancing the protective, ecological and social functions of these areas.

The total aid granted in 2006-2007 reached €9,090,210 with the following breakdown by Autonomous Communities.

SUBSIDIES FOR PUBLIC FOREST MANAGEMENT	
AUTONOMOUS REGION	EXPENDITURE €
Andalusia	980,560
Aragon	922,320
Asturias	1,200,000
Balearic Islands	160,000
Canary islands	405,180
Cantabria	1,371,670
Castilla-La Mancha	336,770
Castilla y Leon	1,642,270
Catalonia	583,280
Extremadura	----
Galicia	116,070
Madrid	536,750
Murcia	----
La Rioja	670,710
Valencia	164,630
TOTAL.....	9,090,210

2. Cartography, Monitoring and Planning works.

The following initiatives were developed during the reference period:

Digital Ground Mapping.

The Digital Ground Map begun in 2005 is part of the Combating Desertification in the Mediterranean project (LUCDEME), which considers detailed knowledge of the ground to be essential, since it is the main natural resource involved in desertification.

Of the 142 sheets of maps published on paper since 1981 (14% of the national territory) 55 contiguous sheets have been digitalised at a scale of 1: 100,000, covering the entirety of the provinces of Almeria and Granada.

Each digital map has been published on a CD that also contains the vector layer files for use with GIS technologies, as well as a report with the specific description of the cartographic unit, complete data for a selection of the edaphic profiles sampled and photographs of the profiles and the unit.

Fig. 4. Cartographic sheet for the Digital Ground Map

Fig. 5. Edaphic profile

These maps have also been cartographically joined and integrated, giving a complete representation of the provinces of Almeria and Granada, as well as a general report on the ground in those provinces.

Appendix IV of the United Nations Convention to Combat Desertification, which is specific to the Northern Mediterranean, and development of the European Strategy for Soil Protection reinforce the need for this cartography, and therefore all existing maps will be published in digital format, grouped into their corresponding provinces and then joined together in order to obtain a continuous cartography of the land.

National Inventory of Soil Erosion (INES)

In general the INES, as a continuation of the previous Maps of Erosive States, intends to detect, quantify and cartographically reflect, on digital and graphic media, the main erosion processes of the soil in national territory, as well as their evolution over time; this requires cartographic activity geared towards dividing the soil into homogeneous systems, measuring the terrain, and finally, integrating and processing the data from both activities.

As initially anticipated, the field work for 28 provinces has already been completed, with the work for 23 of these having been published (Madrid, Murcia and Lugo in 2003; Asturias, Balearic Islands, La Coruña, La Rioja and Navarra in 2004; Cantabria, Gerona, Orense, Pontevedra and Tarragona in 2005; Lérida, Barcelona, Cáceres and Badajoz in 2006; and Tenerife and Gran Canaria in 2007).

The work corresponding to the entire national territory will carry on continuously and cyclically, with an expected periodicity of 10 years and precision on a scale of 1:50,000, thus allowing the constant updating of both the base cartography and the field data, as well as permitting relevant comparisons over time.

In this sense, and in addition to the provinces mentioned above, the work for Alicante, Jaén, Córdoba and Málaga has been published in 2008, and the work for Almería, Granada, Cádiz, Sevilla and Huelva has been finished and is also expected to be published in 2008.

National Action Programme against Desertification (PAND)¹

The drafting and development of the National Action Programme against Desertification (PAND) is the main obligation of our country as a signatory to the United Nations Convention to Combat Desertification (UNCCD). The drafting process for the National Action Programme has gone through different stages, since it is a document that has been developed over a number of years, in cooperation with the previous Ministry of Agriculture, Fisheries and Food and with the Autonomous Communities. A new revision process for the PAND Working Paper was started at the end of 2006, partly due to the need to revise the desertification diagnosis in order to determine in greater detail the distribution and intensity of the desertification problem in Spain. This process was carried out throughout 2007, with new content also being incorporated into the Programme and action begun in the last period integrated into sectors related to desertification.

The revision process started with the aim of applying the advances of the international scientific community and of various bodies that have been working on desertification assessments and diagnoses. This process is therefore carried out by a working group formed by experts belonging to bodies and institutions from the different regions of Spain. The work of the revision group, which will continue throughout 2008, does not only include the improvement and updating of diagnoses at a national scale for their incorporation into the PAND Document, but also the establishment of the basis for an Integrated System of Desertification Assessment and Vigilance to gather and integrate the numerous lines of work being development in Spain; for example, the use of things like remote sensing to perform desertification indexes, or the use of system dynamics models as early diagnostic tools.

The first results of the group's work have allowed notable improvement to the map of risk of desertification in Spain. These results, as well as the proposal of an Integrated System, have been incorporated into the National Action Programme against Desertification (PAND) that the Minister for the Environment presented to the Council of Ministers on December 7, 2007. The approval process for the proposal was started immediately by ministerial order, and is pending approval by the Ministry for the Environment and Rural and Marine Environments.

Map of desertification risk (PAND, December 2007)

DESERTIFICATION RISK	SURFACE (ha)	PROPORTION
Very high	1,029,517	2.03 %
High	8,007,906	15.82 %
Medium	9,718,040	19.20 %
Low	18,721,141	36.99 %

¹ There is more information on the PAND on the Ministry's web site.
http://www.mma.es/portal/secciones/biodiversidad/desertificacion/programa_desertificacion/index.htm

Total for arid, semiarid and dry sub-humid areas	37,476,605	74.05 %
Wetlands and moist sub-humid areas	12,773,820	25.24 %
Water and artificial areas	356,937	0.71 %
National Total	50,607,361	100.00 %

Service distribution by desertification risk categories (PAND, December 2007)

Network of Experimental Stations for Erosion Monitoring and Assessment

This Network intends to coordinate and put to better use the results obtained by different research groups that, since the 80s, have been dedicated to the experimental study of this phenomenon; this currently includes 20 associated centres and over 40 experimental stations.

The Network was initiated in 1996 and has generated measurements and data that are being used to establish an information database concerning the erosion, hydrological and water quality cycle that can be consulted in real time by any researcher or environmental manager, also enabling the fact-based design of preventive and management action in areas sensitive to desertification.

During 2006 and 2007 work was done to improve the exploitation and diffusion of the results generated during the two decades the RESEL Network has been operating. Databases have been created that allow uniform treatment of the information already available and of that which will become available in the future, allowing this information to be put to good use by facilitating its analysis, comparison, exploitation and diffusion. There is also a section on the Ministry's website that allows the disclosure and diffusion of the Network's work, offers information on its activities and members, facilitates the consultation of data summaries and includes the publication of periodical digital newsletters:

<http://www.mma.es/portal/secciones/biodiversidad/desertificacion/resel/index.htm>

Fig. 4. Flowmeter of the Experimental Basin of Morille (Salamanca)

Priority Actions Plan for forestry and hydrological restoration, erosion control and defence against desertification (PNAP)

This Plan, the drafting of which was completed in 2003, was updated in 2006 in order to determine priority sub-basins in need of work; it assessed the work to be performed in the short-, medium- and long-term and determined in what order it should be done and a general timeline for doing so.

The Plan aims to enhance, concentrate and prioritise the actions for the implementation, conservation and improvement of protective plant coverage in areas that are seriously affected by erosion-desertification problems.

Demonstration and Assessment of actions to combat desertification

A study was completed in 2007 that systematically assessed, on the one hand, the reforestation action taken to combat desertification in certain areas, and, on the other hand, the monitoring and evaluation of the regeneration project and the management plan for semi-arid areas affected by desertification.

In the first case a comparative analysis was made of the effects of reforestation on soil. To do this, 35 sample pairs of soil (with and without reforestation) were sampled and analysed. The results showed significant improvement in the soil properties of samples where reforestation took place with respect to soil where none took place. Specifically, both the soil from areas with sclerophyllous vegetation and that from areas with hyperxerophyllic vegetation that had been reforested showed an average CO content of more than twice the average of that in soil that had not been reforested; soil from areas with gypsophyllic vegetation with reforestation showed average CO values of only 64% more than areas without reforestation. All this confirms our knowledge of the role forests play as carbon sinks.

In the second case a series of permanent plots was established and characterised in order to assess regeneration carried out in the area with a very broad range of restoration species (among others, *Quercus coccifera*, *Olea europaea*, *Pistacia lentiscus*, *Rhamnus lycioides*), which led to the conclusion that technological improvements in reforestation have allowed us to obtain better results in plant survival, even under adverse environmental conditions.

3. Institutional and coordination actions

XIV and XV International Course on Forestry and Hydrological Restoration and Erosion Control

This International Course took place in Spain in September 2006 and 2007 in collaboration with the Ministry of Foreign Affairs. Experienced university graduates from Latin America and/or managers of forestry, hydrological management activities, and activities to combat desertification in watersheds attended the course; the course included theory classes given by qualified specialists from the government, universities and companies and fieldwork in Extremadura, with special attention given to the International Convention to Combat Desertification and its Appendices for Specific Application to Latin America and the Caribbean and the Northern Mediterranean.

I Training Course on the Management and Conservation of Forestry Resources in countries of Latin America and the Caribbean

This corresponds to a joint training initiative between the General Directorate for Biodiversity and the Regional Office for Latin America and the Caribbean of the United Nations Programme for the Environment (UNEP-ORPALC). It took place in Costa Rica in December 2007 with the aim of strengthening abilities in forestry and combating erosion and desertification in the region, as well the exchange of experiences between attendees.

II International Symposium on Desertification and Migrations

The “II International Symposium on Desertification and Migrations” was held in Almeria on 25-27 October 2006 within the framework of the “International Year of Deserts and Desertification 2006” declared by the United Nations General Assembly.

Participants from 38 countries attended the Symposium. The matters they dealt with focused on three themes: environmental problems arising from migratory dynamics,

case studies (the relationship between desertification and migration) and political responses, and land management and cooperation for development.

As a continuation of activities from the International Year of Deserts and Desertification, in 2007 the educational kit on desertification prepared by UNESCO was promoted and distributed in Spain. The tasks were:

- To manage, monitor and assess the promotion with the support of UNESCO's Associated Schools Project (ASP).
- To publish the kit's information brochure.

8th Conference of the Parties to the United Nations Convention to Combat Desertification (UNCCD)

During the seventh session of the Conference of the Parties to the United Nations Convention to Combat Desertification, the Spanish government offered to host the next Conference (COP8), an offer that was accepted. The eighth session of the Conference of the Parties (COP8) to the CCD was held in the Madrid Convention Centre from 3-14 September 2007, with the participation of 2,500 attendees from 165 countries and 2 observers, delegates from the signatory countries and institutions, agencies from the United Nations system, international organisations and civil society representatives. The Spanish Minister of the Environment, Cristina Narbona, was elected president of the COP. The term of office of the presidency lasts until the following COP, scheduled for the autumn of 2009.

Meetings of the subsidiary organs of the Convention, such as the Sixth Committee for the Review of the Implementation of the Convention (CRIC 6) and the Eighth Session of the Science and Technology Committee (CST 8), were held at the same time.