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in

Zdruli P. (ed.), Steduto P. (ed.), Lacirignola C. (ed.), Montanarella L. (ed.).
Soil resources of Southern and Eastern Mediterranean countries

Bari : CIHEAM
Options Méditerranéennes : Série B. Etudes et Recherches; n. 34

2001
pages 19-25

The European Soil Information System and its Extension to the Mediterranean Basin

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Introduction

The Euro-Mediterranean Conference, which was held in Barcelona in November 1995, adopted a Declaration establishing a new Partnership between the European Union and 12 Southern and Eastern Mediterranean Partners. Its overall objective is to contribute through enhanced and regular dialogue, free trade and co-operation, in order to guarantee peace, stability and prosperity in the region. Accordingly, the Euro-Mediterranean Partnership encompasses three different aspects:

- a strengthened political dialogue;
- the development of economic and financial co-operation;
- greater emphasis on the social, cultural and human dimension.

The sustainable development objective and its environmental dimension have been fully integrated in the new Euro-Mediterranean Partnership texts. Participants at the Conference emphasised their interdependence with regard to environment, the need for a regional approach, increased co-operation, and better co-ordination of existing multilateral programmes. They recognised the importance of reconciling economic development with environmental protection, of integrating environmental concerns into the relevant aspects of economic policy and of

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mitigating the negative environmental consequences, which might result. They confirmed their attachment to the Barcelona Convention and the Mediterranean Action Plan.

More recently, the entry into force of the United Nations Convention to Combat Desertification (UNCCD) has further raised the attention to the Mediterranean environment. Desertification processes had been at first identified in the Sahelian region of West Africa, but are now accepted as a world-wide problem affecting extended areas in African, Asian, Latin American and European regions.

As explained in a recent press release from the UNCCD Secretariat "desertification does not mean the expansion of existing deserts. It occurs because dryland ecosystems, which cover one third of the world's land area, are extremely vulnerable to over exploitation and inappropriate land use. The overexploitation of the land also reduces its biological richness and its capacity to adapt to climatic changes." The United Nation Convention to Combat Desertification provides four Regional Implementation Annexes in order to promote cooperation and integrated actions among affected countries of each region and sub-region.

The Annex IV deals with the Northern Mediterranean Region and joining Countries, which are Greece, Italy, Portugal, Spain and Turkey. The UNCCD identifies particular conditions of the northern Mediterranean region:

(a) semi-arid climatic conditions affecting large areas, seasonal droughts, very high rainfall variability and sudden and high-intensity rainfall;

(b) poor and highly erodible soils, prone to develop surface crusts;

(c) uneven relief with steep slopes and very diversified landscapes;

(d) extensive forest coverage losses due to frequent wildfires;

(e) crisis conditions in traditional agriculture with associated land abandonment and deterioration of soil and water conservation structures;

(f) unsustainable exploitation of water resources leading to serious environmental damage, including chemical pollution, salinisation and exhaustion of aquifers;

(g) concentration of economic activity in coastal areas as a result of urban growth, industrial activities, tourism and irrigated agriculture.

Within this context, it appears obvious that there is an urgent need for harmonised and updated information about the status of the Mediterranean environment, particularly for soil, as one of the essential elements of the biosphere.

The Commission, as the originator of several programs aiming to acquire soil data, has recently completed the first version of the European Soil Information System (EUSIS). Associated with other sources of information (water, air, land management) these data are a valuable aid for decision support processes, in particular for the control of agricultural production, land management and environmental protection.

The European Soil Information System

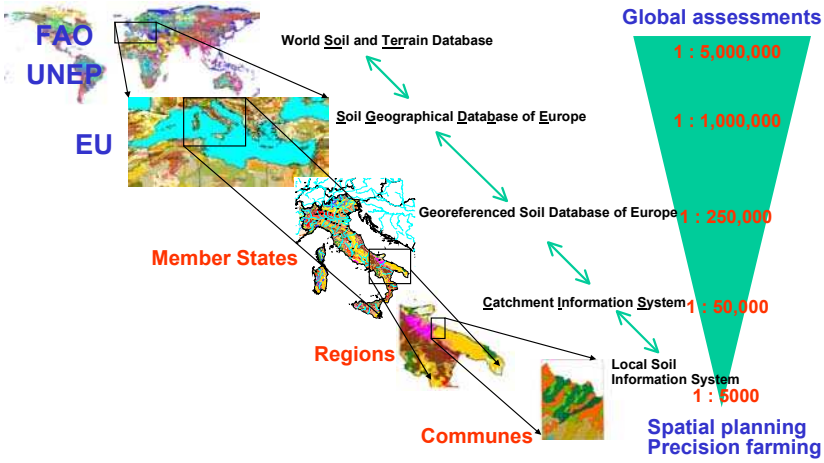
The European Soil Information System (EUSIS) consists of a geographic dataset, a semantic dataset, a soil profile analytical database, a soil hydraulic parameters database and a knowledge database in a fully integrated geographic information system (GIS) within the European Geographic Information Infrastructure (EGII). It is located at the Joint Research Centre (JRC), Ispra, Italy, and is part of the Agriculture and Regional Information Systems Unit (ARIS) of the Space Applications Institute (SAI). It is continuously maintained, updated and improved by a large network of national soil surveys operating under the umbrella of the European Soil Bureau (ESB).

Its aim is the establishment of a common framework at continental scale for the sustainable use of the soil resources in Europe and to provide harmonised soil information relevant to Community policies,

its relevant General Directorates (DG's), to the European Environment Agency (EEA) and to concerned Institutions of the EU Member States. The European Soil Information System (EUSIS) has given to Europe a tool of comparable importance as other well established systems in the United States (National Soil Information System, NASIS) and in Canada (Canadian Soil Information System, CANSIS). EUSIS, the European system, is fully compatible also with the FAO's World Soils and Terrain database (fig. 1).

The development of this soil information system is continuing with the extension of the coverage to the Commonwealth of Independent States (CIS) (former Soviet Union) and to the Mediterranean basin. The main aim is the establishment of a common framework at continental scale for the sustainable use of the soil resources in Europe, including the Mediterranean basin.

The already well established European Soil Information System of the EU is recognised by the participating countries, and by the European Environment Agency (EEA), as a reference for reliable soil information. Its participatory approach allows full integration of already existing knowledge at local level into a European framework. The wealth of in-



formation available in the Mediterranean countries on their soils can therefore be fully recovered and integrated into this European context.

Figure 1. The nested European Soil Information System

The nested European Soil Information System will on one side fully integrate Europe within the future

World Soil and Terrain (SOTER) data base of FAO, expected to be ready by 2002, and on the other end will link up with the existing National and Regional soil information systems within the EU and the Mediterranean countries.

It will address needs by soil information users at different scales, ranging from global change studies at global scale (1: 5,000,000 scale) down to very detailed information for spatial planning and precision farming applications (1:5,000 scale). Intermediate scales of spatial soil information will respond to the needs of the European Union (1:1,000,000 scale), to the EU Member States (1:250,000 scale) and to Regional and Local authorities (1:50,000 scale). The system will be fully integrated with the soil monitoring activities of the European Environment Agency and with the World Soil and Terrain Database of FAO.

The European Soil Bureau

During the last two years there has been a surge of requests to the European Soil Bureau for data on European soils. This increase in activity is due to a number of reasons:

- the establishment of the European Environment Agency requires a large amount of soil related information;
- the growing concern about the impacts of agriculture and other human activities on soils has triggered a number of policies and regulations that need soil information for their implementation;
- specific EU policies, like the Common Agricultural Policy, the 5th Environmental Action Plan, the European Spatial Development Perspective and others, require harmonised soil information within the European Union;
- internationally binding agreements, like the UN Convention to Combat Desertification (UNCCD), call for detailed soil information at a regional

scale (specifically annex 4 of UNCCD requests comparable soil information for the countries of the Mediterranean basin);

- severe environmental disasters (landslides, flooding, etc.) in some EU Member States have raised the issue of adequate soil information for disaster prevention.

These growing demands go far beyond the actual capabilities of the European Soil Bureau and require a much larger and efficient organisation. The recent activities around the establishment of an European Soil Forum, that had its first meeting in Berlin 24-26/11/99, further clarified the needs of coherent soil information for the policy-making process at European level. Networking and participatory approaches are the key to success for such trans-national soil information system. The European Soil Bureau will therefore further evolve into a highly networked organisation, including also the Mediterranean countries, that will interface to the policy-makers through the interface of the Joint Research Centre of the European Commission (fig. 2).

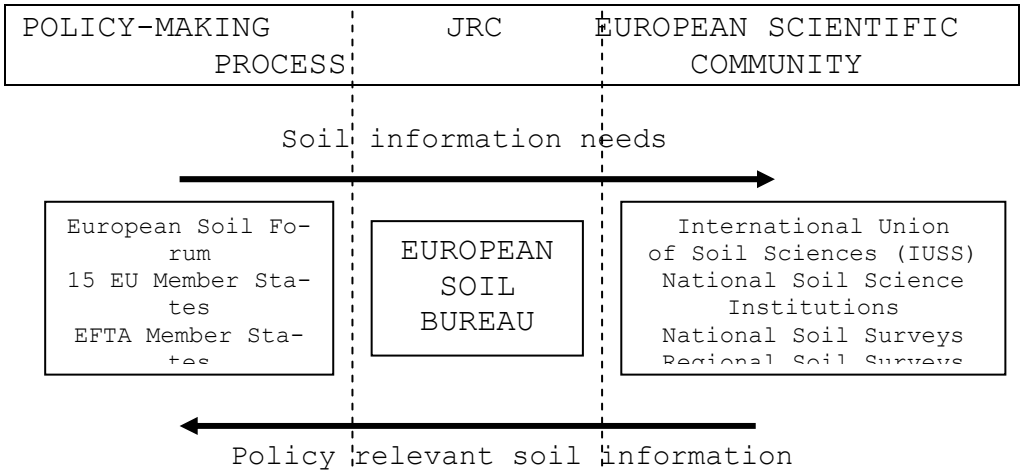


Figure 2. The European Soil Bureau at the interface between science and policy

Extension to the Mediterranean region

One of the priorities identified during the last meeting of the European Soil Forum has been the threat of desertification in the Mediterranean region. The UNCCD is calling upon the establishment of a regional action plan for the countries belonging to annex IV. A common approach seems necessary for this task and calls upon harmonised spatial databases covering soil, climate, land use, vegetation, etc. The same applies for the National action plans and the eventual local plans. The aim of a common approach also for the more detailed scales seems useful for the cross-country comparability of the adopted measures at local level. The current structure of the EUSIS reflects indeed these needs for an integrated approach at different scales as shown in Fig. 1. The extension of the European Soil Information System to the Mediterranean basin will follow essentially this multi-scale approach:

The current coverage at scale 1:1,000,000 of the Soil Geographical Database of Europe (fig. 3) will be extended at the same scale to all the countries of the Mediterranean basin. This task is already on going and we expect to have the full coverage by end of 2001. While this scale is of value for assessments covering the complete Mediterranean region, it is a scale of little value for many National applications.

It has been therefore proposed to promote the creation of a network of National soil surveys that will actively pursue the establishment of more detailed soil databases for priority areas. The role of the European Soil Bureau will in this activity be of co-ordination and technical and scientific support. The basic document underlying this program is the Manual of Procedures of the Georeferenced Soil Database for Europe (doc. EUR 18092 EN). The final result of this programme will be the establishment of a coherent coverage at scale 1:1,000,000 and priority areas (windows) with more detailed information.

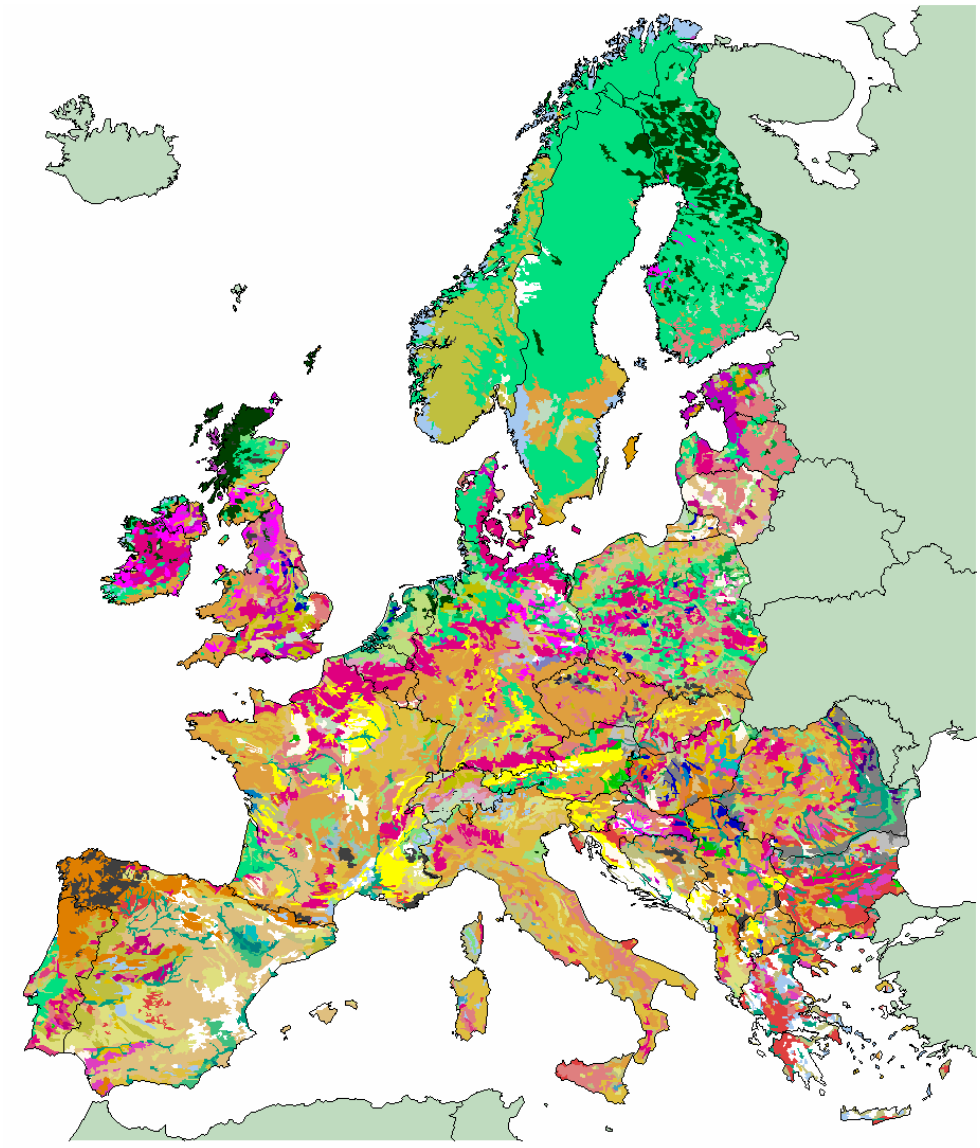


Figure 3. Current extension of the 1:1,000,000 scale Soil geographical Database of Europe

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