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Revised

Committee for the activities of the Council of Europe in the field of biological and landscape diversity

(CO-DBP)

7th Meeting

Draft Revised Soil Charter

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1. At its meeting in Geneva on 19 April 1999 [CO-DBP (99) 15], the CO-DBP:

– took note of the terms of reference assigned to it by the Committee of Ministers with regard to the possibility of updating the Council of Europe's Soil and Water Charters (Committee of Ministers Decision No. CM/708/151298) and expressed its thanks for having been consulted;
– examined the document presented on the possibility of updating the Council of Europe's Soil and Water Charters;
– adopted the opinion on the updating of the Council of Europe's Soil and Water Charters, as it appears below, for the attention of the Committee of Ministers, and decided to submit it to the Committee of Ministers for approval if appropriate.

OPINION OF THE CO-DBP
ON THE UPDATE OF THE COUNCIL OF EUROPE'S SOIL AND WATER CHARTERS
AND ON THE ORGANISATION OF A CONFERENCE ON AGRICULTURE
as adopted by the CO-DBP on 19 April 1999 with a view to submitting it to the Committee of Ministers for approval if appropriate

"*The Committee for the activities of the Council of Europe in the field of biological and landscape diversity (CO-DBP):*

- took note of the terms of reference (Decision No. CM/708/151298) assigned by the Committee of Ministers as regards to the possibility to update the Council of Europe's Soil and Water Charters and to the organisation of a Conference on agriculture, and expressed its thanks at having been consulted;
- adopted the following opinion and decided to submit it to the Committee of Ministers for approval if appropriate.

1. Regarding the opportunity to review the European Soil Charter and the European Water Charter, the CO-DBP considers:

- that in view of the time that has elapsed since the Committee of Ministers adopted the European Soil Charter (1972) and the European Water Charter (1967), and in view of the many changes that have since occurred in Europe, it is highly desirable to review these texts;
- that such a review be carried out as a fundamental contribution of the CO-DBP to the implementation of Action Theme 2 of the Pan-European Biological and Landscape Diversity Strategy on the integration of biological and landscape diversity into sectoral policies;
- that such a review should be made in the framework of the activities of the CO-DBP, taking into account international instruments and programmes already existing or in preparation;
- that it is preferable to maintain the Charter statute of the texts, as they will be reviewed;
- that the completion date for the terms of reference assigned by the Committee of Ministers to the CO-DBP for this activity should be extended to 31 December 2001 (instead of 31 December 1999), in order to enable the CO-DBP to examine the revised texts before submitting them to the Committee of Ministers for approval.

2. […]".

2. At its meeting of 8-9 September 1999 (CM/Del/Dec (99) 677bis 9.2, CM (99) 87 and Addendum), the Committee of Ministers took note of the opinion on the updating of the Charters.

3. The CO-DBP is requested to consider this document and formulate any observations with a view to forwarding the draft Charter to the Council of Europe's Committee of Ministers.

DRAFT REVISED VERSION OF THE EUROPEAN SOIL CHARTER

Explanatory memorandum

Soil is a complex natural resource of fundamental importance to life, but so essential and so obvious that it is the most overlooked element of the environment. In environmental terms soil acts as an interface, constituting the medium for interaction between rocks, water, air and living beings.

Soil's importance to fertility, and therefore food, to biodiversity, to the world climate system and to sustainable use of water obliges public authorities to take appropriate measures, especially since soil is increasingly threatened with various forms of degradation. There is a sharp contrast between how fast soil is degraded and how slowly it forms and is reconstituted. This explains the urgent need for preventive and remedial measures.

One of the reasons why the seriousness and urgency of the situation is underestimated is that soil damage is not always clearly and immediately perceptible but often comes to light through damage to other elements (water, air, flora, fauna). The slowness of certain degradation processes also makes soil an environmental element bearing the marks of the ecological consequences of farming, industrial, spatial development and town planning practices.

Concern about conservation and sustainable management of soil is not often directly reflected in national environment law. There is little national legislation dealing solely with soil as a fragile natural resource to be safeguarded. Legal definitions of the environment do not systematically include soil among its constituent elements. Nonetheless, soil is sometimes mentioned as an element necessitating protection in vulnerable natural areas (forests, mountains) or as an environmental component endangered by dumping of wastes.

International law fails to take into consideration all of the implications of soil and tends to disregard it as such. The Council of Europe was the first to issue a legal instrument on the subject with its Resolution (72) 19 of 30 May 1972. Then, on 26 November 1981, the FAO adopted the World Soil Charter, which is non-binding in nature.

Articles 10.b and 11.e of the World Charter for Nature, adopted by the General Assembly of the United Nations on 28 October 1982, refer to soil, stating that "the productivity of soils shall be maintained or enhanced through measures which safeguard their long-term fertility and the process of organic decomposition, and prevent erosion and all other forms of degradation" and "areas degraded by human activities shall be rehabilitated for purposes in accord with their natural potential and compatible with the well-being of affected populations".

The two Rio conventions on biological diversity and climate change of 1992 concern soil in some indirect, but scientifically obvious, ways. Soil is the very foundation of biodiversity and is also itself an important biological resource, forming an integral part of all terrestrial ecosystems. Soil has also been identified as a source of greenhouse gases and a substance which stores them. It therefore has a not insignificant, regulating effect on climate change.

Chapter 10 of the Agenda 21 action plan adopted in Rio in 1992 deals with an integrated approach to the planning and management of land resources, setting a more global objective, focussing on land as a broader subject than soil and one less easy to pin down in scientific terms. Two recent conventions also foster a better contribution of soil in environmental policies. The first is a world convention but in fact primarily concerns Africa and is confined to one aspect of soil management, the problem of degradation of arid, semi-arid and dry sub-humid soils. This is the Paris Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa of 17 June 1994. The second is a regional instrument, solely concerned with mountain areas in the Alps, signed as a special protocol to the Alpine Convention of 7 November 1991. This is the Bled Protocol on soil protection of 16 October 1998.

The European Union has not introduced any specific soil protection measures because of the absence of any precise legal basis for this in the Treaty on European Union and the complexity of the subject. However, Community legislation does deal with soil indirectly through various directives (on nitrates, sludge, environmental impact studies, etc.). Because of the cross-disciplinary nature of soil problems, several directorates general are interested in the subject (environment, agriculture, regional policy)[1].

[1] "Down to earth : soil degradation and sustainable development in Europe", UNEP-European Environment Agency, environmental issues series, n° 16, Luxembourg, 2000, p. 24.

The recent interest in soil results from the following activities:

1. From 1996 to 1998 concerted action was taken at European level to assess risks on contaminated sites and hence on industrial soil pollution. The aim was to propose joint research activities under the European Union's CARACAS scheme (Concerted Action on Risk Assessment for Contaminated Sites). Another form of concerted action, NICOLE (the Network for Industrially Contaminated Land in Europe)[2], was launched in 1995 under the European Community Research Programme on "Environment and Climate". Finally, since 1998 a network of 16 European countries, co-ordinated by the Austrian Environment Agency and assisted by the European Commission, has continued to examine the issue and organise multidisciplinary management through CLARINET (the Contaminated Land Rehabilitation Network for Environmental Technologies in Europe)[3], which is the successor to the CARACAS initiative.

These two networks now form part of the 5th European Community Research Programme and provide social, economic and political input for studies and discussions aimed at producing technical and strategic recommendations to protect land from industrial contamination[4].

Their immediate aim is to encourage international co-operation on soil pollution.

2. On 11 December 1998 the Committee of the Regions adopted an opinion on "Further development of Community environmental policy and the creation of an ecological union"[5]. Soil is dealt with in paragraph 7 of this opinion, which calls for soil use to comply with the principle of sustainability, meaning that measures taken by the Community, the member States and local and regional authorities should be based on the following principles:

- more economical and careful use of soil;
- protection of particularly valuable soil from degradation and sealing, and suitable handling of unavoidable excavation residues;
- priority for development of brownfield sites;
- recycling of polluted soil and suitable handling of polluted soil;
- reduction of erosion and prevention of landslides and similar geological phenomena;
- reduction of toxic inputs.

3. The draft 6th Environment Action Programme of the European Community 2001-2010 discusses the subject and even proposes a new thematic strategy for soil protection:

"Little attention has so far been given to soils in terms of data collection and research. Yet, the growing concerns on soil erosion and loss to development as well as soil pollution illustrate the need for a systematic approach to soil protection, covering:

- Erosion and desertification
- Pollution from landfill waste sites, industry and mining.
- Pollution from air, water, and from some agricultural practices and the application of sewage sludge contaminated by heavy metals, organic pollutants or pathogens;
- Erosion of land and therefore soil for development.
- The role that soil plays in climate change as a carbon sink.

Given the complex nature of the pressures weighing on soils and the need to build a soil policy on a sound basis of data and assessment, a thematic strategy for soil protection is proposed. The EU research programmes should support this work."

A preliminary draft of the thematic strategy on soil was submitted to the public in 2001[6].

Another attempt to enhance the various relevant parties' interest in soil was made by the European Commission's directorate general on the environment and certain member States by setting up a forum for the pooling of information and the discussion of a programme of action to protect soils in Europe, the European Soil Forum (ESF), which met for the first time in Berlin in November 1999. Members of the forum include Switzerland and central and eastern European countries, which shows how much interest there is throughout Europe in an initiative on soil.

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[2] NICOLE Internet site at www.nicole.org
[3] CLARINET Internet site at www.clarinet.at
[4] P. Cortesi, H. Kasamas and A. J. Lexis, "European networks for sustainable concepts and research needs, CLARINET and NICOLE", Land contamination and reclamation, vol. 9, N° 1, 2001.
[5] Opinion of 11 December 1998, OJEC no.198 of 14.7.1999, p. 30.
[6] Draft outline on soil paper (http ://europa.eu.int/comm.. environment/agriculture/consultation)

4. Lastly, mention must be made of a private initiative by a number of soil scientists, gathered together in the International Society of Soil Science, who, following the World Congress of Soil Science in Montpellier (France) in 1998, drew up a draft convention on soils, named the Tutzing initiative after a colloquy "Time for soil culture - temporal perspectives on sustainable use of soil"[7] held by the Protestant Academy in Tutzing, Germany.

Our conclusion should be that, since there is currently no general legal instrument at either world or European level concerned with all aspects of soil conservation and addressing soil's many functions essential to life, the charter produced by the Council of Europe in 1972 should now be revised to make it possible to establish formal co-operation between European states, following on from the new initiatives of the European Union.

The Council of Europe could once again be the driving force for co-ordinated action to protect soil in Europe, either through the informal means of a document encouraging appropriate action or by preparing an international convention setting out action to be taken and making for fully-fledged co-operation on practical activities regarded by the states as priorities, so that soil protection can also make a tangible contribution to sustainable development.

Summary of action taken by the Council of Europe

At this point it may be appropriate to summarise the many initiatives and decisions taken by the Council of Europe on the subject of soil conservation since 1972. Two periods can be distinguished.

1. Towards a possible European Soil Convention

After the Committee of Ministers adopted the Soil Charter, calling on states to promote a genuine soil conservation policy, at its 211th meeting on 30 May 1972, it became apparent that soil degradation (erosion, contamination with toxic waste, salinisation, urban sprawl, etc.) was becoming more widespread and speeding up, and some states (the Netherlands, Switzerland, Liechtenstein, Italy, Germany) reacted by passing specific legislation.

The Parliamentary Assembly of the Council of Europe also adopted a number of recommendations (including 859 (1979) on land use and 966 (1983) on heavy metals in agricultural soil). In Recommendation 1048 (1987) on the consequences for agriculture of current soil degradation, adopted on 27 January 1987, it invited the Council of Europe to draw up a convention on soil protection. Participants in the 5th European Ministerial Conference on the Environment, held in Lisbon on 12 June 1987, then recommended that the Committee of Ministers study the possibility of preparing a suitable convention. Along the same lines, in its Resolution 182 (1987) on soil protection the Standing Conference of Local and Regional Authorities of Europe requested the Secretary General to submit a draft soil convention to it.

On the basis of these mandates, the Steering Committee for the Conservation and Management of the Environment and Natural Habitats (CDPE) commissioned a feasibility study for an international legal instrument on soil protection. This was consistent with the aims of Committee of Ministers Recommendation No. R (89) 15, which followed on from Resolution No. 1 on "rational use of land: basis or limiting factor of our development" adopted by the European Conference of Ministers responsible for Regional Planning held in Lausanne on 20 and 21 October 1988.

Recommendation No. R (89) 15 on rational use of land: basis and limiting factor of our development, which was adopted on 7 November 1989, was solely concerned with land from the regional development angle, as a spatial resource supporting a variety of activities, and not with a global view of land/soil embracing all of its environmental functions.

The feasibility study commissioned in 1988 was carried out by two experts (a scientist, Professor W.E.H. Blum, and a legal specialist, Professor M. Prieur). After discussing the concept of soil, its functions and the causes of soil degradation, this document looked at comparative and international law on the subject, before going on to propose a number of principles and strategies in the form of specific measures or activity programmes, which might be included in a convention or a recommendation (report MEN-6 (90) R,

[7] www.soil-convention.org

presented at the 6th European Ministerial Conference on the Environment, held in Brussels on 11 and 12 October 1990).

The 6th conference of European environment ministers in Brussels adopted a Resolution - No. 1 - on soil protection, which acknowledged the importance of a global, integrated policy for soil conservation at the national and international levels and recommended that the Committee of Ministers take gradual action, starting with a recommendation and concluding with the preparation of an outline convention, possibly with protocols, by 1993.

At the same meeting in Brussels, on 12 October 1990, the Committee of Ministers adopted Recommendation No. R ENV (90) 1 on the European conservation strategy, which recognised that the environment was Europe's common heritage and contained an Appendix, in which soil was included among the sectoral aspects addressed. Point 7 of section IV on soil reads "Reinforce legal provisions and their application at national level and, if necessary, draw up a European legal instrument on soil protection."

In its Resolution 219 (1991) of 19 March 1991, reiterating its desire for a convention on soil protection, already voiced in 1987, the Standing Conference of Local and Regional Authorities of Europe expressed great regret at the fact that the 6th conference in Brussels had not immediately accepted the principle of a convention, although it had not ruled out the possibility for the future.

In the end, the main text adopted as a first step towards fulfilment of the terms of reference given at the 6th conference in Brussels proved to be a recommendation by the Committee of Ministers on soil protection (Recommendation No. R (92) 8 of 18 May 1992). This text, which included appendices, reiterated most of the main ideas of the feasibility study of 1990 and therefore confirmed the urgent need for co-ordinated international action on soil, recommending that states adopt a general policy founded on a number of common principles.

Agreement on the principle of a convention was not reached by 1993, and this led the Council of Europe bodies to turn towards the idea of a new European Soil Charter, possibly as a preliminary to an international agreement.

2. Towards a new European Soil Charter

The suggestion that the Committee of Ministers review the European Soil Charter was made by the Parliamentary Assembly of the Council of Europe in its Recommendation 1350 (1997) on global challenges for agriculture. At the same time, it recommended that the Committee of Ministers "consider strengthening [the Charter's] legal force".

On this basis the Committee of Ministers adopted Decision No. CM (708) 151298 of 15 December 1998, giving the Committee for the activities of the Council of Europe in the field of biological and landscape diversity (CO-DBP) terms of reference to look into "the advisability of reviewing and updating the European Soil Charter and European Water Charter and, if appropriate, making proposals for giving them greater legal force, bearing in mind work being carried out in other international bodies".

At its meeting on 19 April 1999 in Geneva [CO-DBP (99) 15] the CO-DBP:

- took note of the terms of reference it had been given by the Committee of Ministers concerning the possibility of updating the Council of Europe's Soil and Water Charters (Decision of the Committee of Ministers No. CM/708/151298) and expressed its thanks at having been consulted;
- examined the document submitted to it concerning the possibility of updating the Soil and Water Charters;

adopted an opinion on updating of the charters.

The Committee of Ministers took note of this opinion at its meeting on 8 and 9 September 1999 (CM/Del/Dec (99) 677 bis/9.2, CM (99) 87 and Addendum).

At its 6th meeting on 24 February 2002 in Budapest [CO-DBP (2002) 6], the CO-DBP:

- examined the draft revised Charter [CO-DBP (2002) 2];
- noted that, following the wish of the Committee, the draft revised Charter did not have a legally binding character;
- suggested some amendments so as to stress the incitative character of the Charter;
- decided to examined an amended version at its next meeting [CO-DBP (2002) 2 revised].

Revised European Charter
for the protection and sustainable management of soil

The Committee of Ministers of the Council of Europe,

In view of the Council of Europe's earlier initiatives concerning soil protection at both the parliamentary and the intergovernmental levels, in particular the European Soil Charter, the European Regional/Spatial Planning Charter, its own Recommendation (92) 8 on soil protection and Parliamentary Assembly Recommendation 1350 (1997) on global challenges for agriculture (including forestry, fisheries and aquaculture), adopted following a report by Mr H. Scheer (Doc. 7845, 13 June 1997);

Having regard to the proposal, under the Pan-European Biological and Landscape Diversity Strategy, to prepare European charters on sustainable development as part of the implementation of Action Theme 2 of the strategy by the Council of Europe;

Taking into account the activities and projects of other international, governmental and non-governmental organisations in the field of soil protection, in particular the Rio Conventions on biological diversity and climate change (1992), the Paris Convention on desertification (1994) and the Bled protocol on soil protection in the Alps (1998);

Making specific reference to the soil protection activities of the European Community under its agricultural and environment policies and its draft thematic strategy for soil;

Bearing in mind that some member states of the Council of Europe have enacted specific national legislation on soil;

Aware of soil's fundamental role in supporting human, animal and plant life, as a key factor in preserving a high degree of biological and landscape diversity and as a reflection of the right to life, health and a healthy environment;

Concerned by the growing chemical, physical and biological degradation of many soils in Europe, particularly those intended to be left in their natural state and those intended for agricultural and forestry use, which are increasingly affected by erosion, air and water pollution, dumping of waste, salinisation and urban development;

Wishing to instil an awareness that the effects of soil degradation are not merely local but cumulative, and that such degradation accordingly constitutes a global threat to the foundations of life, comparable with the major environmental problems at world level, such as climate change and loss of biodiversity;

Wishing to draw attention to the close interrelationship between soil and water and the need for links to be established with the European Water Charter;

Concerned that co-ordinated international action at European level is a matter of urgency, in view of the tendency for soil degradation to speed up and the slowness of the processes whereby soil is reconstituted;

Convinced of the need for rapid action by European states to institute information, research and monitoring arrangements, treating soil as a whole with a view to its integrated sustainable management at the national and international levels;

Recalling that the revised European Charter for the protection and sustainable management of soil has not a legally binding character;

Adopts and proclaims the principles of the revised European Charter for the protection and sustainable management of soil, as set out below.

1. Definition and functions of soil

A. Definition

a. Soil is a component of terrestrial ecosystems and constitutes the outer layer of the Earth's crust. It is found at the interface between the Earth's surface and the underlying rock and is a medium (the pedosphere) in which rocks (the lithosphere), air (the atmosphere), water (the hydrosphere) and living beings (the biosphere) are intermingled. Soil naturally occurs in successive sub-horizontal layers (or horizons), with specific physical, chemical and biological properties and different functions.

b. Depending on past use of land and ecological and environmental factors, soil layers may vary in thickness, from a few centimetres to a number of metres. Soil is directly linked with aquifers and the water contained in them, as an element of the hydrological system.

Soil can include underground water, whether confined or not, the subsoil, the sea bed and river beds.

B. The functions of soil

a. Soil in itself is a living medium with intrinsic value.

b. Soil has two types of function: ecological functions and functions linked to human activity.

i. Ecological functions which are essential to humankind

- Producing biomass, the basis of human, animal, plant and micro-organism life, since it ensures a supply of food, renewable energy and raw materials.
- Filtering, buffering and transforming actions and serving as a reservoir to protect groundwater and the food chain from pollution.
- A biological habitat for many plant and animal organisms and a gene pool of importance to the survival of humankind.

ii. Functions resulting from human activity

- Soil is the physical medium for a range of socio-economic and cultural activities in the fields of town planning, industry, transport, farming, waste disposal and leisure.
- Soil is a source of raw materials, supplying water, clay, sand, gravel, minerals, etc.
- Soil is a cultural heritage. It is a repository of natural and human history, containing palaeontological and archaeological remains. It underlies and shapes the landscape.

2. Soil degradation

Soil is threatened with degradation from many sources. Degradation is damage to or destruction of soil, adversely affecting one or more of its functions. The causes may be natural or human.

A. Forms of degradation

a. physical degradation due to urban sprawl, erosion caused by development, transport projects or road construction, various types of mining activities, or destruction or compaction and sealing of surface soil as a result of intensive farming techniques.

b. biological degradation caused by sediment formation, acidification, natural salinisation and organic impoverishment of soil.

c. pollution caused by acidifying, toxic and chemical substances, particularly heavy metals, radioactive substances, dumping of household, industrial or radioactive waste, use of fertilisers and plant protection products, or spreading of sewage sludge or livestock waste.

d. degradation as a result of wind or water erosion or inappropriate farming or forestry practices.

B. Interaction of different forms of degradation and their effects

Soil is increasingly exposed to diffuse or specific attack from a variety of sources, which makes it more vulnerable to degradation. Soil degradation is thus frequent and rapid, whereas the reconstitution process is as slow as ever, if not impossible. Depending on the nature of the degradation, the damage may be reversible or irreversible.

a. Reversible damage is any type that can be repaired by nature or through technical processes such as compaction or surface sealing. It also includes medium- or long-term chemical or biochemical degradation through soil pollution by organic compounds.

b. Irreversible damage is damage that cannot be remedied or can only be repaired in the very long term, such as soil loss through urban sprawl, extraction of materials or erosion, contamination with radioactive substances, advanced acidification and salinisation and/or alkalisation.

3. Objectives

This foreseeable degradation and damage should be countered with preventive measures at the national and European levels, serving the following objectives in the interests of present and future generations:

a. Sustainable use of all kinds of soil, according to local circumstances, so as to preserve the diversity of the functions and components of the soil in a given site and maintain a balance between the processes of soil formation and soil degradation.

b. Sustainable preservation of biodiversity in the soil.

c. Lasting fertility of the soil, so as to ensure a healthy food source; this is achieved through use of farming methods appropriate to local conditions and special measures to protect the activity of the living organisms found in soil.

d. Integrated management of soil through co-ordination of economic, environmental and spatial planning policies and the various national and local institutions and administrative bodies active in the field of soil.

4. Fundamental principles

a. Soil is a common heritage, and its protection is in the public interest.

b. States should implement a soil protection policy as part of their environmental protection and sustainable development policies.

c. Soil should be regarded as a limited, non-renewable natural resource.

d. Any use of soil should take account of its multiple ecological functions, with a view to their preservation.

e. Soil protection should be systematically taken into consideration in all other policies, in particular farming, forestry, mining, industrial, tourism, transport, town planning and spatial development policy.

f. Where there is a risk of serious damage to one of the ecological functions of soil and when there is scientific uncertainty as to the extent of future soil deterioration, the precautionary principle should be applied, ie the emphasis should usually be on caution, and emergency measures should be adopted where necessary.

5. Recommendations for the future management of soil

A. General recommendations

a. Growing erosion, urban expansion, development of transport and road infrastructure and the increasing quantities of waste to be stored require prudent management of soil through inventories, planning and the application of soil quality criteria.

b. Placing priority on the conservation of pollution-free farmland entails managing the use of space as rationally as possible.

c. Integrated soil management would benefit from:

– the establishment of a national advisory body to issue guidelines for public policy on soil protection;
– the setting up of bodies to co-ordinate national sectoral policies and national and local measures;
– or similar arrangements designed to achieve the same purposes.

d. Rare soil-types are a resource of valuable scientific and heritage interest. If threatened they need to obtain some degree of protection that could permit the conservation of its peculiarities. A way to protected threatened soil-types is through their identification and the establishment of soil protection zones or other appropriate mechanism.

e. Through ecologically sound, sustainable management, any current or planned use of land should permit, if not the soil's subsequent use for a variety of functions, at least its future use for a different function, chosen by society, without necessitating special treatment.

f. Land use should, as far as possible, cause only reversible changes in soil, particularly when they result from agricultural, forestry and tourism activities.

g. Sustainable soil management in accordance with specific quality objectives should be a condition for the granting of any direct aid in the form of a subsidy or loan or any unilateral or contractual incentive measures. Extensive farming should be particularly encouraged.

B. Recommendations concerning various specific uses of soil

a. Farming and forestry

Soil use for farming and forestry should be sustainable. ~~This entails~~ Where appropriate, this may entail:

– a ban on certain farming methods;
– promoting a balance between agriculture, forestry and pastoral activities;
– applying the precautionary principle and providing compensation when soil is lost or damaged.

Priority must be given to preserving organic matter in the soil, as it is in most danger. Excess mechanisation may overstretch soil's capacity, disrupt its natural balance and, hence, fail to bring increases in yields. Depending on the type of soil under consideration, rearing of certain animals should be restricted or forbidden, and irrigation controlled.

Sustainable farming using new agricultural practices (organic farming, precision farming, integrated farming, no-till farming on plant mulch, which halves both time spent working the land and the use of inputs) and safeguarding of hedges, slopes, natural watercourses and wetlands will help to preserve the soil, while simultaneously~~providing better quality produce for consumers and~~ promoting the upkeep and enhancement of the landscape. An inventory of sustainable practices should be made.

Forest management and logging techniques should be geared to preventing soil degradation by reducing erosion and harmful compacting of the ground.

b. ~~Urband~~Development

~~Urban d~~Development needs to be carefully planned so as to avoid taking over good quality land, particularly in soil protection zones, farming and forest areas or protected natural areas, and to limit impermeabilisation of the ground. It should provide scope for the emergence of areas devoted to urban agriculture. The integration of soil consideration into planning and rural development policies should aim to the sustainable use of soil and to the improvement or restoration of degraded soils.

Spatial planning policy will be improved by paying special attention to peri-urban areas, where town meets country, and prevent development from piecemeal degradation of rural areas.

c. Engineering projects and transport infrastructure

Certain major works or building projects have a far-reaching impact on soil by altering natural drainage, watertables and the landscape. Local impact assessment should be preceded by a global impact study, on the basis of plans and programmes, taking account of how irreversible artificialisation of the soil will affect surrounding areas.

Special attention needs to be paid to temporary installations (quarries, gravel pits), whose operators should bear the restoration costs.

d. Contaminated soil

The gravity of the problems posed by old or recent contaminated sites (such as waste dumps, former mines, former factories and sites of old accidents) requires an appropriate soil protection policy to prevent degradation and promote restoration and rehabilitation.

1. Prevention necessitates strict control of installations, storage areas and dumps, whether above or below ground, under the operator's responsibility, taking account of the soil's nature and quality, ~~and~~ of any standards or guidelines that member states follow, and of all other relevant circumstances~~setting mean contaminant concentration limits~~. Permanent monitoring of sites and surrounding areas, allied to risk assessment procedures, ~~should~~ be employed in order to ensure that such facilitates are manages without unacceptable risk to soil resources arising from the escape of contaminants. Any incidents should be

immediately and appropriately dealt with~~allow stored substances to be removed immediately if signs of damage to the soil or contamination come to light~~. No storage should be irreversible. Any change in site ownership should be preceded by an environmental audit and should be reported to the public authorities.

2. Restoration of a polluted site entails:

– systems enabling identification of potential harm to soil resources, and initiation of appropriate action~~systematic preliminary inventories to identify sites that may have been polluted~~;
– spatial and town planning regulations that include measures ensuring any subsequent use of former polluted sites is suitable, based on risk assessment~~governing the subsequent use of former polluted sites and prohibiting certain uses of sites that have been irreversibly contaminated~~;
– determining who has technical and financial responsibility for restoring contaminated soil, according to the "polluter pays principle". Since soil is a public asset which renders free environmental services to the community, those services must be taken into consideration when setting a value on soil;
– selection of restoration techniques using physical, chemical or biological processes - phyto- or bio-remediation. However, it may sometimes be preferable to leave polluted sites as they are, to avoid reactivating certain contaminants which have been immobilised.

6. Instruments for the sustainable management of soil

With a view to the sustainable preservation of soil, the states of Europe need co-operate in promoting a soil policy and consider, as appropriate, the following measures:

a. Inventory

Each state may carry out an inventory of its soil resources, setting up a soil observatory organised around a number of permanent monitoring sites.

This observatory would analyse the current state of the soil, using satellite observation techniques and appropriate maps and charts based on a geographical information system, and should continuously monitor foreseeable changes in the soil. It will provide reference material for the preparation of a sustainable soil use index through regular assessment and comparison of changes in soil conditions in selected areas and systematic comparison of different periods and areas.

A co-ordinated European network of soil observatories should be set up on the basis of a European soil observation and monitoring programme, established in co-operation with the European Environment Agency. This network will help to produce a co-ordinated system of soil maps, lay down criteria for assessing sustainable use of soil and draw up a standardised classification of soil types at European level.

b. Scientific research

States may undertake interdisciplinary scientific research with a view to the protection and sustainable management of soil, focussing on:

– natural causes of soil degradation;
– anthropogenic causes of soil degradation, taking into account both air-borne and land-based factors;
– observation and analysis of biodiversity in the soil and its importance to soil's functions;
– contaminants' effects on soil's intrinsic processes;
– simulation models to facilitate integrated soil management;
– interaction between society or given population groups and the soils they utilise;
– the know-how and knowledge possessed by users of the soil, particularly farmers.

States could exchange information and co-operate on current and future research programmes, with a view to establishing a standard methodology, and should contribute to the creation of a European soil data base.

c. Education

Interdisciplinary teaching on soil and its sustainable preservation should be part of the curriculum at all educational levels. Specific applied courses should be taught in colleges of engineering, agronomy, forestry and civil engineering and as part of continuing education for the building and public works industries and rural communities.

d. Information

Public information on the need for sustainable preservation of soil, and means of achieving it, should be developed, conveying an understanding of the diversity and variability of specific local and regional pedological features.

European states are invited to co-operate in facilitating data and information exchange between themselves and with the relevant international bodies, in particular with the assistance of the European Environment Agency.

e. Participation

At national, local and regional level any decision or operation affecting soil and land (regulations, planning, contracting, project implementation) need to be based on the principle of participation. This should entail particular emphasis on:

– participation in decision-making, especially by women and local people;
– recognition that occupancy of land and its use for human activities necessitates involving all the parties in a locality in defining, implementing and monitoring decisions and actions;
– public access to procedures for the settlement of disputes concerning or arising from land use.

f. Planning

To ensure the sustainable use of soil, taking account of its suitability, quality criteria and current and foreseeable uses, an appropriate, specific planning process should be introduced and closely co-ordinated with spatial and town planning instruments, which should allow for special soil/land planning.

This planning process, implemented at the local and regional levels, should be devised in close co-operation with various local operators (local government authorities, industry, farmers, non-governmental organisations).

Planning should encompass not only the ways in which soil is to be used, but also its preservation (through the creation of protection zones), improvement and restoration (particularly in the case of contaminated soil).

g. Impact study

Impact studies relating to activities, plans or programmes with a direct or indirect impact on soil need to include a soil study. This may include:

– systematically involve scientific analysis of the condition of the soil;
– assess the effects on soil quality in the short and the long term, both direct and indirect;
– check the biodegradability of substances or waste coming into contact with the soil;
– note any irreversible effects;
– recommend means of preventing or limiting any foreseeable degradation.

h. Specific measures

Where appropriate the~~The~~ states of Europe should take action to protect soil health and soil resources by, *inter alia*:

~~– establish a joint soil research, observation and monitoring programme, focussing on soil degradation and rehabilitation of contaminated sites;~~

~~– issue recommendations and guidelines concerning essential preventive measures, such as:~~

- restricting or prohibiting certain activities in protection zones;
- limiting use of heavy machinery on certain types of soil;
- prohibiting or regulating the spreading of fertilisers, pesticides, sewage sludge and liquid or solid animal waste;
- regulating landfill operations;
- regulating waste dumps;
- regulating the deposit of rubble, mining waste or industrial waste (toxic or not);
- determining irreversibility thresholds;
- drawing up codes of good practice for soil management purposes, combining regulatory instruments and conditional incentive measures;
- openness in public information on farming practices and use of inputs;
- on-site monitoring of use of inputs;
- monitoring of mining and extraction activities.