



# The European Perspective on Soil Quality

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## Background

Soil delivers services through its **functions** (COM 2002/179)\*:

- (1) food and other biomass production,
- (2) storing, filtering and transformation of materials,
- (3) habitat and gene pool of living organisms,
- (4) physical and cultural environment for humankind and,
- (5) source of raw materials.

The ability of soil to perform any of these functions (on given levels) depends on its physical, biological and chemical attributes ('internal' attributes), while the realization of the performance is conditioned by natural (e.g. slope steepness) and/or anthropogenic (e.g. drainage) factors ('external' factors). All factors are time dependant.

**The ability of soil to perform specific functions and the risk of negative effect on soils functions are in the central concept of the applied soil quality approach - the soil thematic strategy** - in Europe.

### **Basic requirements of soil quality evaluation:**

- help to identify existing potential to perform functions,
- indicate sensitivity to external influences,
- assist in monitoring land conditions for sustaining plant and animal health.

## The conditions set in EU proposals

The Soil Thematic Strategy in the European Union (COM(2002)179) declares that for sustainable development, soils (soil functions) need to be protected from degradation. Main threats to soil are identified as

- (1) decline in organic matter, (2) soil erosion,
- (3) compaction, (4) salinisation, (5) floods,
- (6) landslides, (7) contamination and (8) sealing.

## The conceptual framework for assessment

In the soil quality assessment process soil functions and major influencing factors have to be matched.

The term '**Soil Functional Ability**' is used to describe the composition (number of) and evenness of distribution of different soil qualities (the functions a soil provides on given levels). Together with the soil response dynamics to different external influences a complex characterization of '**Soil Quality**' becomes available. Weighting of the importance of specific soil functions in special cases is a valid option, taking local preferences or potentials into account.

**Matching major (land use driven) threats and soil (and land) characteristics with regards to soil functions is the tool to evaluate 'Soil Sustainability'.**

Assessment of soil quality recognizes that the relative importance of soil functions are both spatially and temporally variable.

Consequently, rather than a single universal expression of soil quality that characterizes the 'goodness' of soil, the conceptual approach in Europe allows for the implication of different quality perceptions for a wide range of applications (including economic analyses on a common bases of measurable parameters).

Thus, the evaluation of soil quality can support the synergies between local soil use options and regulative (the Common Agricultural Policy of the European Union, international conventions etc.) conditions.

## Proposal for risk identification for the major threats in the European Union

For each one of area-dependent major threats, the following conditions have been examined in order to define common criteria of risk identification throughout Europe:

- identification of factors/hazards related to threat ('external' factors),
- characterization of receptor ('internal' attributes),
- performance specification, model selection (with data requirements).

\*COMMISSION OF THE EUROPEAN COMMUNITIES - COM(2002) 179 final - COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Towards a Thematic Strategy for Soil Protection, Brussels, 16.4.2002