

# Criteria of efficient strategies and concepts for the protection of soil

In November 2008 the European funded development project URBAN SMS (Urban Soil Management Strategy) was launched in Stuttgart. Municipalities and institutions of Austria, the Czech Republic, Italy, Poland, Slovakia and Slovenia, are participating. The 11 partners in the project intend to develop strategies and measures for an improved provision of the non-renewable and finite soil resource. Even though the soil use has been already identified as a central problem it is still complicated to confine the impact especially on soil with high quality. Therefore it is the preferential objective of all partners to work towards a sustainable usage of soil.

Prof. Dr. Gerd Wolff, City of Stuttgart, Department for Environmental Protection, Stuttgart (D)

URBAN SMS can build on several experiences which the City of Stuttgart gained in context of the processing and the implementation of the soil protection concept Stuttgart (BOKS, LANDESHAUPTSTADT STUTTGART 2006). From the beginning not only experts from administration and universities but also practitioners, which means urban planners and representatives of the municipal councils, were involved in important processes of development. As a result the requirements of users concerning strategies and concepts for soil protection could be identified and considered. This contributed decisively to the acceptance and the practical applicability of BOKS.

## Basic criteria of efficient soil protection strategies and concepts

During the processing and the implementation of the BOKS six basic criteria have become apparent. These criteria base on each other and are important for the conceptual realisation of effective strategies for soil protection (see Fig. 1). Depending on the level of development there are operative, strategic and practical criteria which are specified below.

### Criteria 1: Planning map of soil quality

To evaluate soils and their usage suitable functional maps are required. Their development does not require a scientific soil mapping necessarily. According to the experiences rather an *image of the soil capacity* in ecosystems is needed (natural soil functions like natural fertility, balancing of cycle processes, filter and buffer). This is corresponding analogously to the map of soil quality. The soil quality can also be derived provisionally by single soil functions (for example natural fertility). Planning maps of soil quality can also be developed by using other sources of spatial information, like maps of agricultural soil assessment or forestal site mapping. As the planning scales require mostly a preciseness of hectares the scaling of the planning maps of soil quality must not be more detailed than six soil quality levels.

### Criteria 2: Methods and indicators

The use of the soil quality map for *planning purposes* needs methods to measure and to prognosticate as well as to balance the use and the revitalisation (including actions of compensation) of soil in a quantitative as well as in a qualitative way. On this basis indicators can be derived by which negative as well as positive impacts on soil can be documented and monitored. Pure area parameters are unsuitable for that. The obligation to a conservative and economic treatment of soil (LANDESRREGIERUNG BADEN-WÜRTTEMBERG 2004) requires rather also an assessment of qualitative effects (BUNDESREGIERUNG 2006).

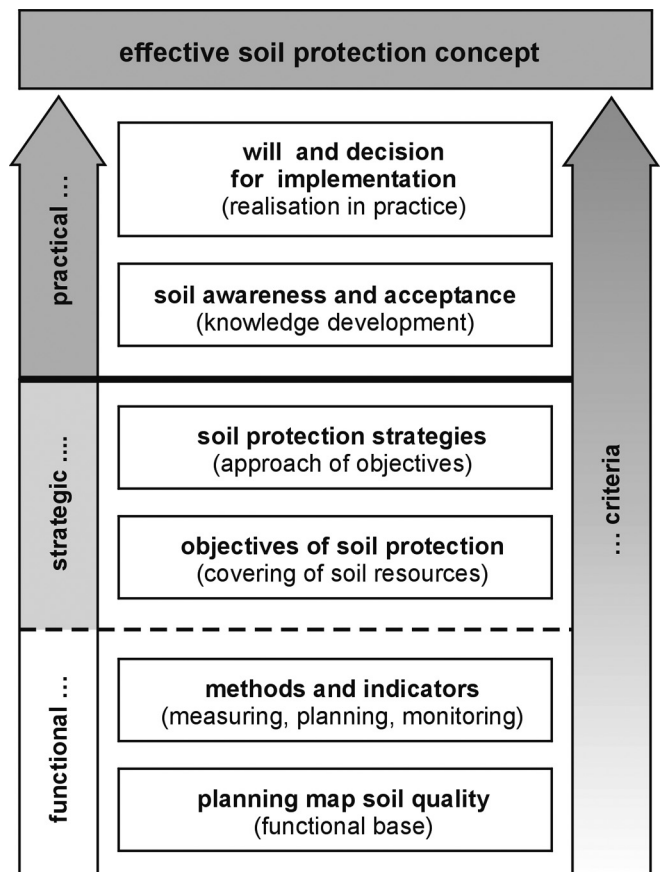


Fig. 1: Criteria of an effective soil concept.

In practice points rationing schemes which combine area and soil quality have been proved in this context (WOLFF 2006, BUNDESMINISTERIUM BADEN-WÜRTTEMBERG 2006).

### **Criteria 3: Objectives of soil protection**

Promising soil protection objectives must follow *sustainable approaches*. In this consequence the local soil resources must be largely maintained on the contemporary level. Thereby economic treatment of soil does not imply a general interdiction of use. That means certain soil losses are tolerable unless they are minor compared to the existing inventory. The opportunity arises to align the objectives of protection with the complete inventory of soil capacity, respectively with their quality. Certainly it would be possible to realize these objectives by identifying protective areas (for example for qualitative first-class soils). The acceptance of such off-limits areas is empirically low. Area independent approaches for example like score systems comparing to BOKS offer more flexibility. Hence they are more favourable.

### **Criteria 4: Soil management strategies**

Regardless of the definition of objectives suitable strategies are required. They have to show how to obtain the targets. The consequent inner urban development and the directing of inevitable use on soils of lower quality is a part of it. So a soil management strategy is a kind of an *operation guideline*. It determines how to manage the economic treatment of soil in practice and in which direction the planning should be oriented to. In this context only such strategies are sustainable and lead to the desired results which guarantee an enduring protection of the local soil inventory (WOLFF 2007).

### **Criteria 5: Soil awareness and acceptance**

Important is the *transition from theory to practice*. To reach an appropriate decision planners and decision makers must be aware of the following consequences of soil impacts: The loss of soil (soil functions) implies not only a damage of agricultural area. It has more far-reaching effects. These are problems like the managing of rain fall and flood water drainage, air-pollution (determined by the failure of soil as sorbent for dust), drinking water supply, negative impacts on climate as well as the loss of recycling potentials of organic materials (compost, dung, slurry, biowaste). These issues must be mostly controlled in technical ways and they raise frequently extensive costs. First the awareness of the functional roles of soils as well as of the consequences of soil use provides the required acceptance to reasonable soil protection strategies and concepts. Usually such approaches are considered as reasonable and acceptable which can be understood also by non-experts like planners and political decision makers. They also have to be able to handle a soil protection concept as well as to realize its strategies. This

requires simple combinations and manageable methods as well as realistic objectives. Empirically acceptance can be established if a soil protection concept and its objectives do not predetermine decisions. They should not be considered as an obstruction but rather as a planning support. If this intension can not be communicated the expectation of acceptance is generally low and there is hardly a chance of implementation.

### **Criteria 6: Will and decision for implementation**

If a general acceptance of a soil protection concept and its strategies exists only the will and a binding decision for implementation are missing. Thus the competent authorities – for example the municipal council – have to declare the implementation as well as the *application of the soil protection concept*. This includes also the requirement of a monitoring for controlling. Not before methods and objectives as well as strategies have been defined as obligatory for all stakeholders a soil protection concept makes public effect.

### **Outlook**

*The practical efficiency of a soil protection concept and related strategies is ensured if during the processing the performance of aforementioned criteria is respected.*

In case of consequent implementing the most negative impact on soil in urban areas – that is the sealing of soil – can be diminished and controlled. ■

### **References**

- *Bundesregierung* 2006. Baugesetzbuch (BauGB). Bundesgesetzblatt 2004 Teil 1, S. 2414 ff, Fassung vom Dezember 2006.
- *Landeshauptstadt Stuttgart* 2006. Bodenschutzkonzept Stuttgart (BOKS). Schriftenreihe des Amtes für Umweltschutz: Heft 4/2006, 70 S. WOLFF, GERD. 2006. Das Bodenschutzkonzept Stuttgart (BOKS) – messen, planen und steuern der Bodeninanspruchnahme. Altlastentag Hannover 2006, Tagungsband, 5 S.
- *Landesregierung Baden-Württemberg* 2004: Gesetz zur Ausführung des Bundes-Bodenschutzgesetzes (Landes-Bodenschutz- und Altlastengesetz – LBodSchAG). – GBL. Baden-Württemberg vom 28. Dezember 2004, Nr. 17: 908-913.
- *Umweltministerium Baden-Württemberg* 2006. Das Schutzgut Boden in der naturschutzrechtlichen Eingriffsregelung, 24 S.
- *Wolff, Gerd* 2006: Das Bodenschutzkonzept Stuttgart (BOKS) mit der „Planungskarte Bodenqualität“ – Messen, Planen und Steuern der Bodeninanspruchnahme. – In: BodenMärkte – Bodennutzung der Zukunft, Umweltministerium Baden-Württemberg (Hg.): 51-58.
- – 2007. The Stuttgart Soil Protection Concept – Methods, Goals, Strategies. – In: 2<sup>nd</sup> Int. Conference on Managing Urban Land, Federal Ministry of Education and Research, BMBF, (Hg.): 11-16.
- – 2008. Merkmale (funktions-)tauglicher Bodenschutzkonzepte. Eine Analyse mit Beispielen aus Stuttgart. – FH Osnabrück, Funktionsbewertung urbaner Böden im kommunalen Flächenmanagement, Beiträge Diskussionsforum Bodenwissenschaften, Heft 9: 23-35.
- – 2009. Das Bodenschutzkonzept Stuttgart (BOKS) – Monitoring der Bodeninanspruchnahmen 2006 und 2007 – Bodenschutz.

### **Contact**

Prof. Dr. Gerd Wolff – [gerd.wolff@stuttgart.de](mailto:gerd.wolff@stuttgart.de)  
Landeshauptstadt Stuttgart, Amt für Umweltschutz  
Gaisburgstraße 4, D-70182 Stuttgart, Germany  
[www.stuttgart.de/bodenschutz/](http://www.stuttgart.de/bodenschutz/) / [www.urban-sms.eu](http://www.urban-sms.eu)