

## **SOIL TRETMENT IN LEGISLATIVE**

The land is treated as a renewable resource, but its renewal is becoming progressively costly and difficult. Renewal of land is possible only in circumstances of restricted land use and with appropriate soil treatment. If there are less quality soil resources that make theirs regeneration more problematical, off course, in case it is possible at all. In average conditions 2,5 cm soil-layer forms from beginning to end in a period of 300-1000 years.

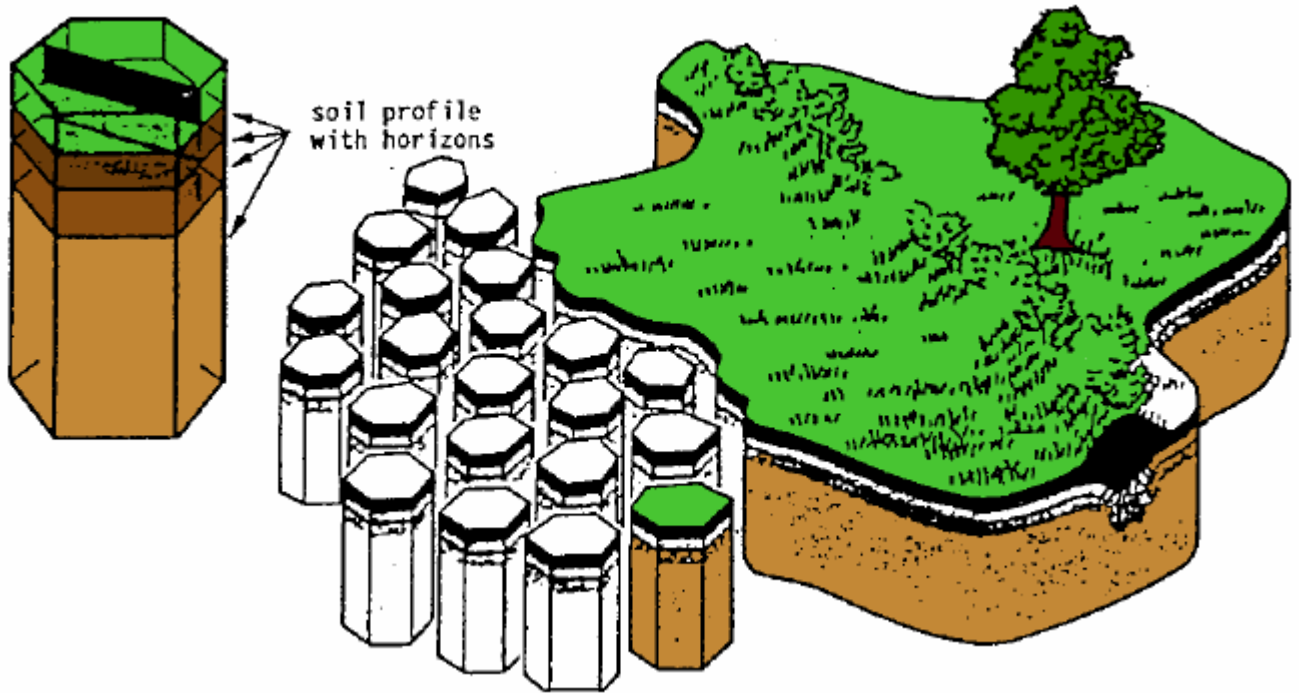
There is a range of instruments in spatial planning which consists of direct or indirect measures to improve state of land and policies related to economical, technical, financial issues as well as issues of law and organization. Having a plan it self doesn't mean too much because it gains its value only when instruments and measures are incorporated in a plan. The most important indirect measure is education and dissemination of awareness on responsibility to the space we are living in.

## **SOIL TREATMENT**

Importance of all kind of resources is obvious, of natural resources just as well as of those which were made by human activities, but soil is essential resource where scarce of soil jeopardizes the existence of all Humankind. Today, when the number of people on the Earth is increasing, thus provoking grater needs on soil we use for living or working and, of course, food production, awareness forming about importance and state of soil resources is particularly significant.

If we want to protect the soil resources on time, we should introduce its characteristics, ways we jeopardize it, and more important, ways of soil quality conservation and improvement.

Therein, scientific approach to soil geneses could be the first step, just as well as introducing to factors and processes which were the most important in soil horizons forming. In getting more knowledge about soil, awareness on its macro morphological characteristics (color, texture, structure...), soil physic and chemic (ph, salt level...) is significant. This way we get opportunity not only to reconstruct soil geneses stadiums but even to predict changes or changes possibilities judging by input and output facts.



Source: W. Blum "The Negotiable landscape-Towards a Sustainable Use of Soil Resources", 2004

There are a great number of human activities by which human with awareness or without it, directly or indirectly, provoke soil degradation. Among these activities we can extract basic types of degradation<sup>1</sup>:

- sealing ( by building, infrastructure constructing etc)
- compression
- local and diffuse contamination
- erosion
- eutrophication
- salinisation
- nutrient depletion
- acidification

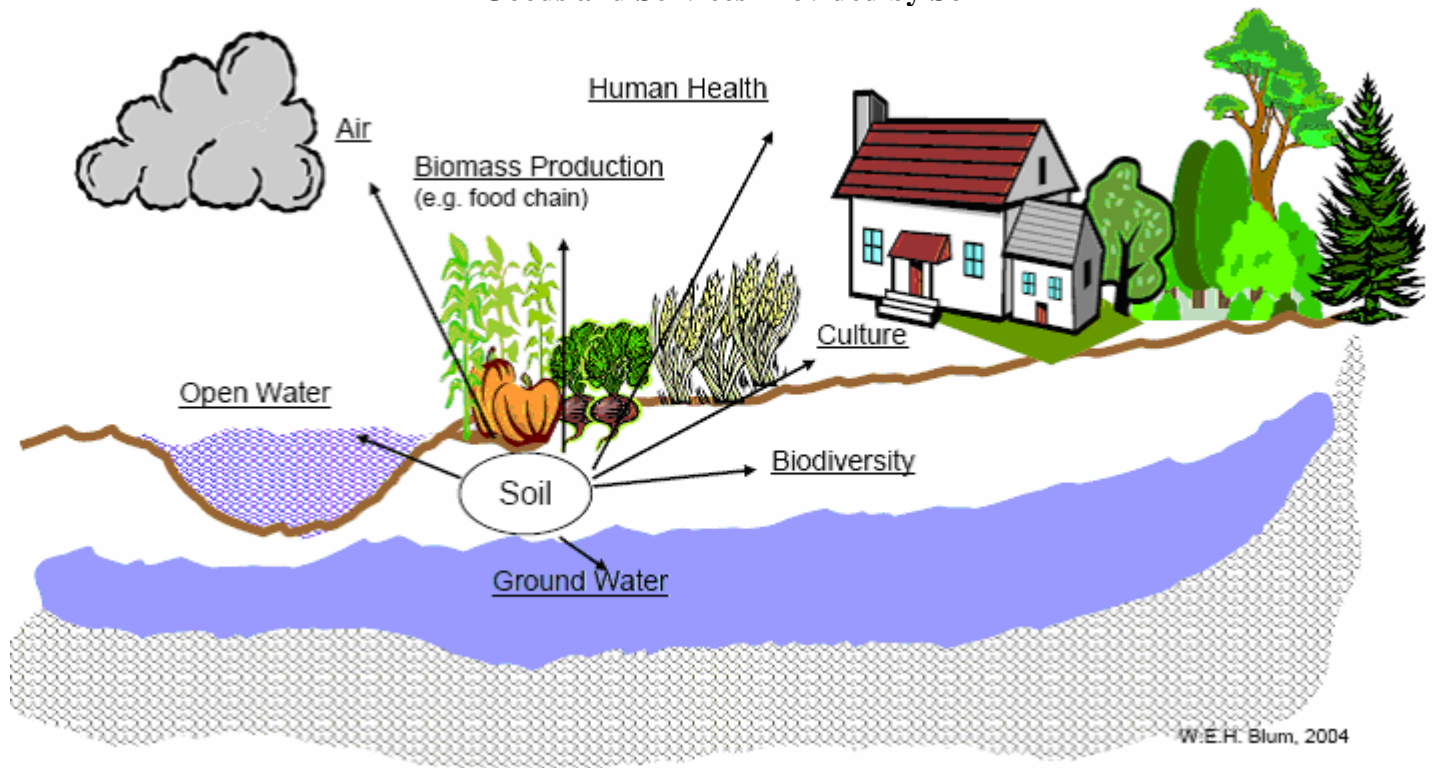
### SOIL FUNCTIONS - MULTIFUNCTIONALITY

Kinds and intensity of soil functions for Men have been constantly increasing from the moment of human existence on the Earth. After complete analyses, we would be probably realize that there is no soil function to Men, once existed but no more. One of the functions from the beginning, but still the most relevant, is food production which, through history, was becoming more and more complex and completed with whole range of other functions like industry, raw extracting etc.

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<sup>1</sup> W. Blum and G. Varallyay "Soil Indicators and Their Practical Application", ISCO 2004-13<sup>th</sup> International Conference, Brisbane, 2004

## Goods and Services Provided by Soil



Source: W. Blum "The Negotiable landscape-Towards a Sustainable Use of Soil Resources", 2004

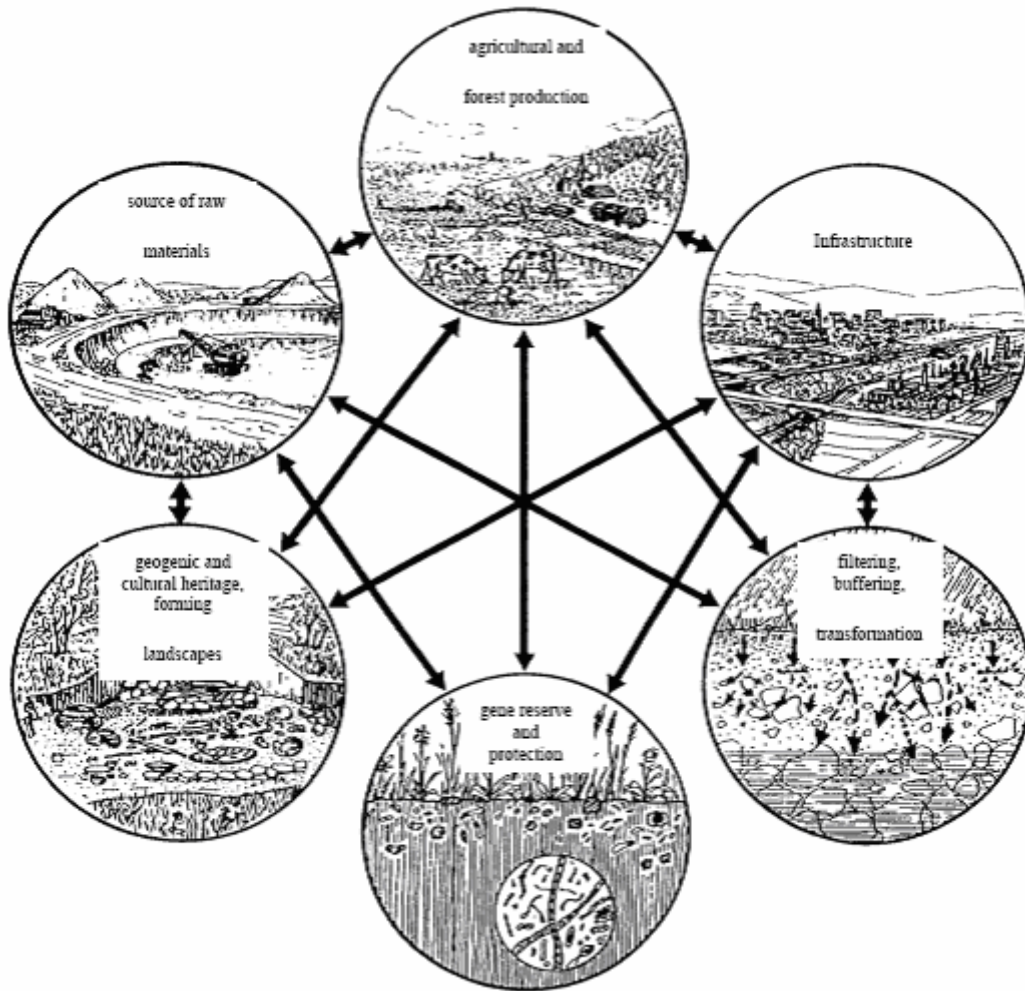
We can distinguish those functions which soil had before Men appeared, independent of human: forest and vegetation productivity in general (biodiversity), filter and collector for underground waters, air warming regulator, renewable energy; and functions which Men gave to soil: building, mining, industry, transport etc. Professor W. Blum distinguish six main functions of the soil<sup>2</sup>:

1. Agricultural and forest production
2. Infrastructure
3. Filtering, buffering, transformation
4. Gene reserve and protection
5. Geogenic and cultural heritage, forming landscape
6. Source of raw materials

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<sup>2</sup> W. Blum "The Negotiable landscape-Towards a Sustainable Use of Soil Resources", 2004

## Soil Functions Competitiveness



Source: W. Blum "The Negotiable landscape-Towards a Sustainable Use of Soil Resources", 2004

### THE DPSIR CONCEPT APPLIED TO SOIL

The idea of DPSIR concept is to approach to issues (related to soil) resolving by following steps:

- Driving forces
- Pressures
- State
- Impacts
- Responses

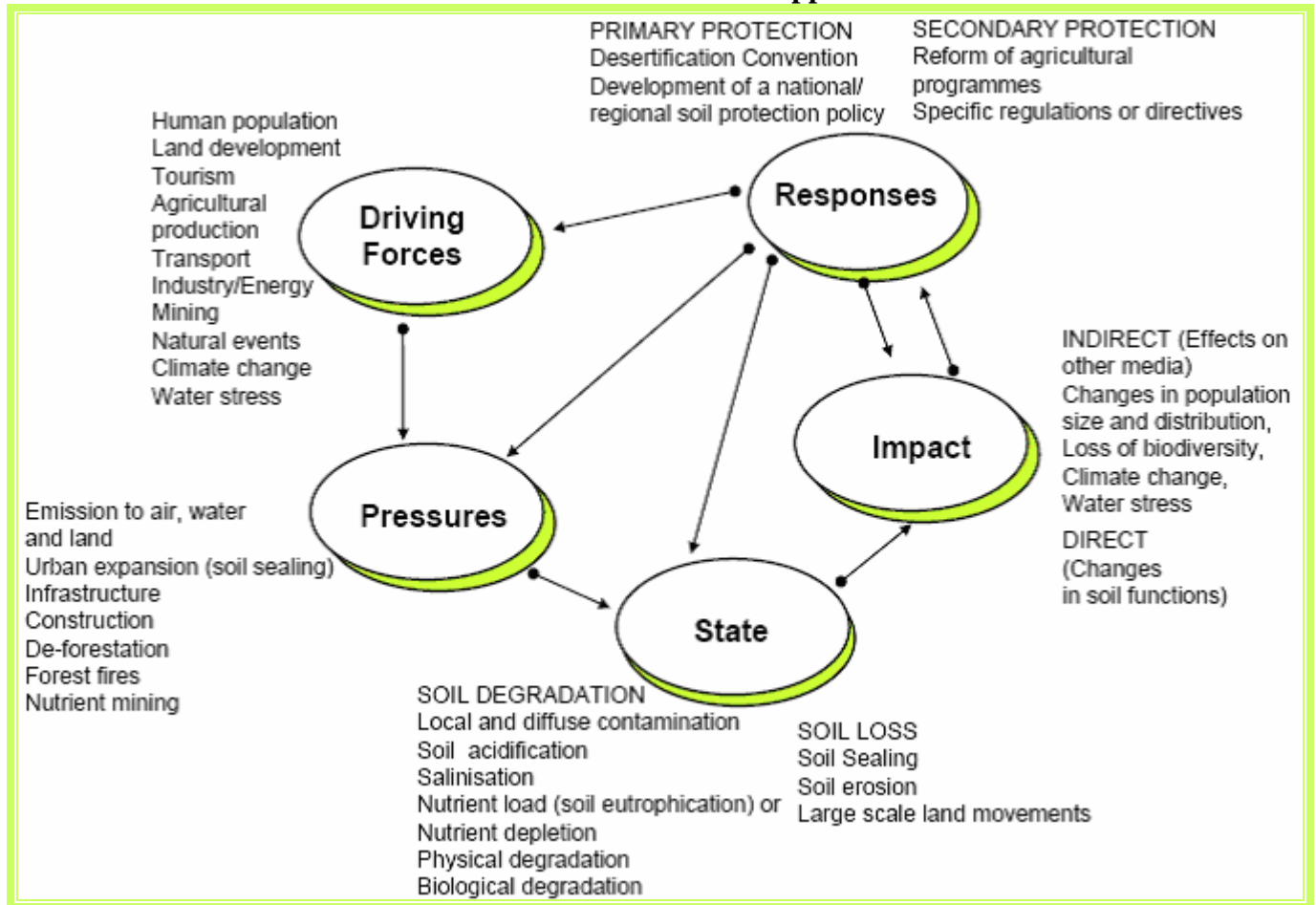
This means that first step is to identify social, economical, ecological or cultural causes which brought the soil to certain state.<sup>3</sup> When we note the cause/causes the second step is to identify concrete processes which

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<sup>3</sup> W. Blum and G. Varallyay "Soil Indicators and Their Practical Application", ISCO 2004-13<sup>th</sup> International Conference, Brisbane, 2004

contribute to state of soil (e.g. erosion, contamination etc). Present soil state is consequence of processes which integrated influence to soil as a pressures, and it should be recognized. The state changes, the most probably, bring to capacity changes, so the next step is impact realizing and means to identify changes in soil use, actually, changes in soil function. And finally, when we know cause (Driving force) and its repercussion (State) the task is to find out which instruments and measures do we need to bring back previous condition quality and function to the soil. Those instruments and measures can be legal, economical, technical etc, but common to all of these is direct acting on causes (Driving forces), not on cause manifestation (Pressures).

### The DPSIR Framework Applied to Soil



Source: W. Blum "The Negotiable landscape-Towards a Sustainable Use of Soil Resources", 2004

## WORLD AND SERBIAN REGULATIVE TO SOIL

The most of documents and laws which include soil issues are not titled and dedicated especially to soil, but their basic thematic is dedicated to environment in a whole. Environment concerns our surrounding where we exist and live, everything around us and that can be natural or human-made values. Soil, altogether with air, water, geological resources, forests, flora and fauna is natural value.

Soil, as one of the environment elements, is protected by constitution of declarative regulations which consists of protection principles, as well as by regulations on ways, instruments and measures of protection. At the other hand, there are regulations constituted to treat different kinds of criminal, illegal actions of individuals, legal and responsible entities.

No matter what kind of regulations we are speaking of, there are those brought on international level and national level. International-level regulations are not obligatory, but in case that state signs international agreement and ratifies it, automatically, agreement becomes obligatory for this state and it has to be incorporated in that state law system.

Illegal actions which harm quality or completely destroying natural resources (soil) are called ecological delict. He who does ecological delict, most the time, achieves it by doing some activities (logging, contamination etc), but also by not doing (e.g. not applying protection measurement against erosion on agricultural soil).

In international or Serbian documents, by which environment is legally protected, protection can be directly oriented on one element of environment or on environment in a whole. There is a question: is object of protection environment as a whole system or only one component of that system or by protecting environment we indirectly protect life and health quality of people?

Harmful effect of human conduction to environment, and that way to soil, is a fact. Many kinds and sources of pollution are not aware on abstract political-administrative borders, so responsibility on this issue is usually common for two or even more neighbor countries. Some of the issues became so serious that the only way to fix it is global-level solving (e.g. global climate warming). The most of international conventions were initiated and organized by United Nations. Principles of sustainable development are, today, the most important for applying different human activities and have a special place in soil protection. Some of the soil related Conventions are: UN Convention on Climate Change, Kyoto Protocol, and Basel Convention on Cross-border transport control of dangerous waste and its keeping, Convention on Cross-border Air Contamination on far distance etc. In 2003 Convention on Human and Minority Rights and Citizens of Serbia and Montenegro Liberties were brought which guarantees, among another things, right on healthy environment as well as right on public environment condition information. Laws and another documents regarding soil treatment in Serbia are: Law on Environmental Protection, Law on Strategic Environmental Impact Assessment, Law on Integrated Impeding and Control of Environment Contamination, Law on Environment Impact Assessment, Law on Waters, Law on agricultural soil, Spatial Plan of Republic of Serbia etc.

Results of international cooperation are conventions as documents which rarely include clearly defined and resolved issues, but most of their content is dedicated to member countries responsibilities regarding to convention principles. Idea is that more detailed results and actions should be found during the time, on regular and other meetings, where experience exchange, gained from the moment of signing the convention to the

moment of the meeting, means bringing out new ideas and Protocols as new parts of Convention. That way we get a way reliable response but in longer time which, surely, should be spared.

Regarding to Serbian Laws, in Law on Environment Protection soil does not have a special treatment because this document by itself is dedicated to environment in a whole, but in Law on Waters and Agricultural soil there are a few aspects on soil and soil protection issues.

## **GOALS AND STRATEGIC PRIORITIES RELATED TO THE SOIL MULTIFUNCTIONALITY**

### Sustainable Development Definition

Before starting with concrete tasks and strategic priorities a question on terms we are dealing with should be resolved. Thus, comprehending term of sustainable development is confusing because different people consider different meaning by expression of sustainability. There are even different definitions of sustainable development today. Some of them are:

SD is a development that meets the needs and aspirations of the current generation without compromising the ability to meet those of future generations.

SD is preservation and protection of diverse ecosystems-the soil, plants, animals, insects and fungi while maintaining the forest's productivity.

SD is economic development that is achieved without undermining the incomes, resources, or environment of future generations.



### **Urban soil**

In a sense of sustainable development there is a question if doing nothing with soil in urban areas is better solution than treating it in some inappropriate way? Human needs in using soil and volume of its exploitation have been changing through history parallel with basic human activities with most of them sealing soil.

## Origin of the towns and their activities:

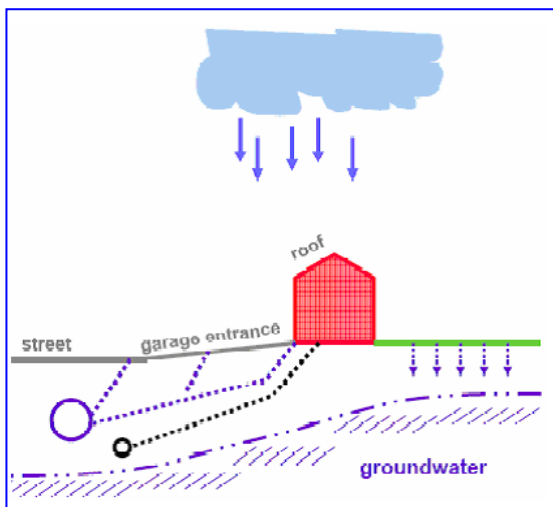
- |                  |   |                         |
|------------------|---|-------------------------|
| 1. Hunters       | C |                         |
| 2. Farmers       | I | Sustainable Development |
| 3. Manufacturers | T | Sustainable Development |
| 4. Industrials   | Y | Sustainable Development |
| 5. Services      |   | Sustainable Development |

Sustainable Development  $\left\{ \begin{array}{l} = \text{LIFE IS NOT EASY} \\ = \text{LIFE GETS EASIER?} \end{array} \right.$

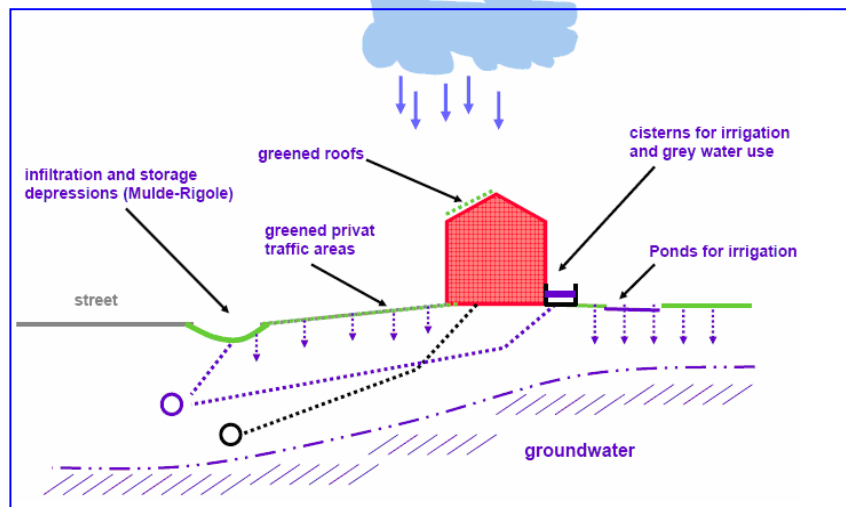
## Objectives and goals:

- Optimization each function of the soil use for:
  - Housing
  - Working
  - Recreation and tourism
  - Industries
  - Transport
  - Urban agriculture
  - Non aedificandi (open green space)
- Estimating kind of soil use priority according to the quality of the soil as to enable urban development
- Establishing all recommended urban uses of the soil

### Urban Process



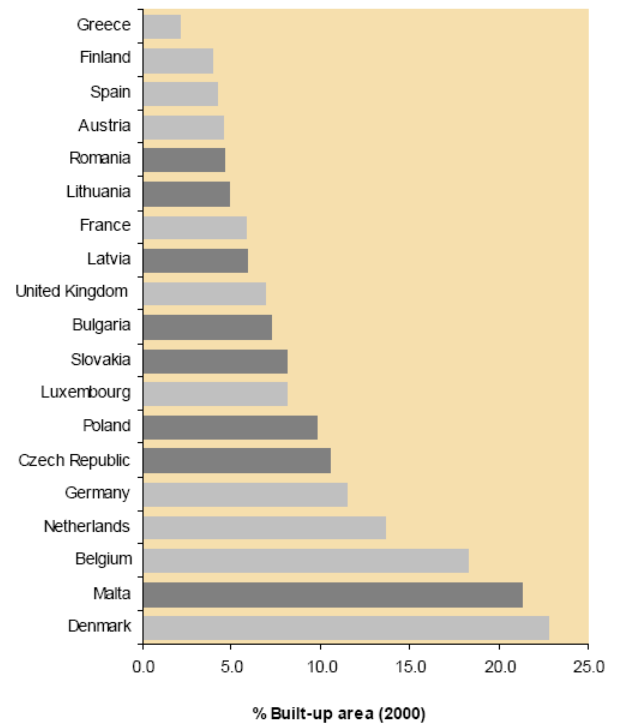
### Urban Process Alternative



Source: Turan, B. Y.; Furdikova, B.; Stupakova, I.; Nikolic, V.; Dornier, W. "Science City"

- Creating a proper town land use regulations:
  - Land and soil use strategy
  - Land use regulations
  - Construction regulations
  - Property regulations

5. Balance between different soil functions depending on the existing activities in a particular urban area<sup>4</sup>
6. Flexibility of the land and soil use and its multifunctionality
7. Enabling community agreement on the values (broad negotiation process)
8. Brownfield and how to reuse it<sup>5</sup>
9. To find economic tools for multifunctional soil and land use:
  - Incentive
  - Taxes
  - Fiscal
10. Data-base for soil quality is necessary to be made as a foundation for decision-making on soil rehabilitation:
  - Taxation oriented to proper soil use utilization
11. Education on soil:
  - Incorporated in a school system
  - Disseminated among politicians and another decision-makers
  - Disseminated among people whose work is connected with a soil
  - Global consciousness on soil characteristics and importance
12. To analyze matter on urban sprawl
13. Legal awareness in terms of soil protection
14. Analyze driving forces trends for the future development related to soil use
15. Improve interregional and international cooperation as well as information exchange related to the state of the soil and soil development perspectives
16. The role of natural elements inside the city:
  - Estimate what kind and how many greenery the city needs to become a sustainable one
17. Estimate how the property rights can influence the multifunctionality of the soil
18. Create a common indicators for measuring a various soil characteristics
19. Develop tools for economic evaluation of the multifunctionality of the soil potential from sustainable point of view<sup>6</sup>



Source: T. Prus "Soil Indicators"

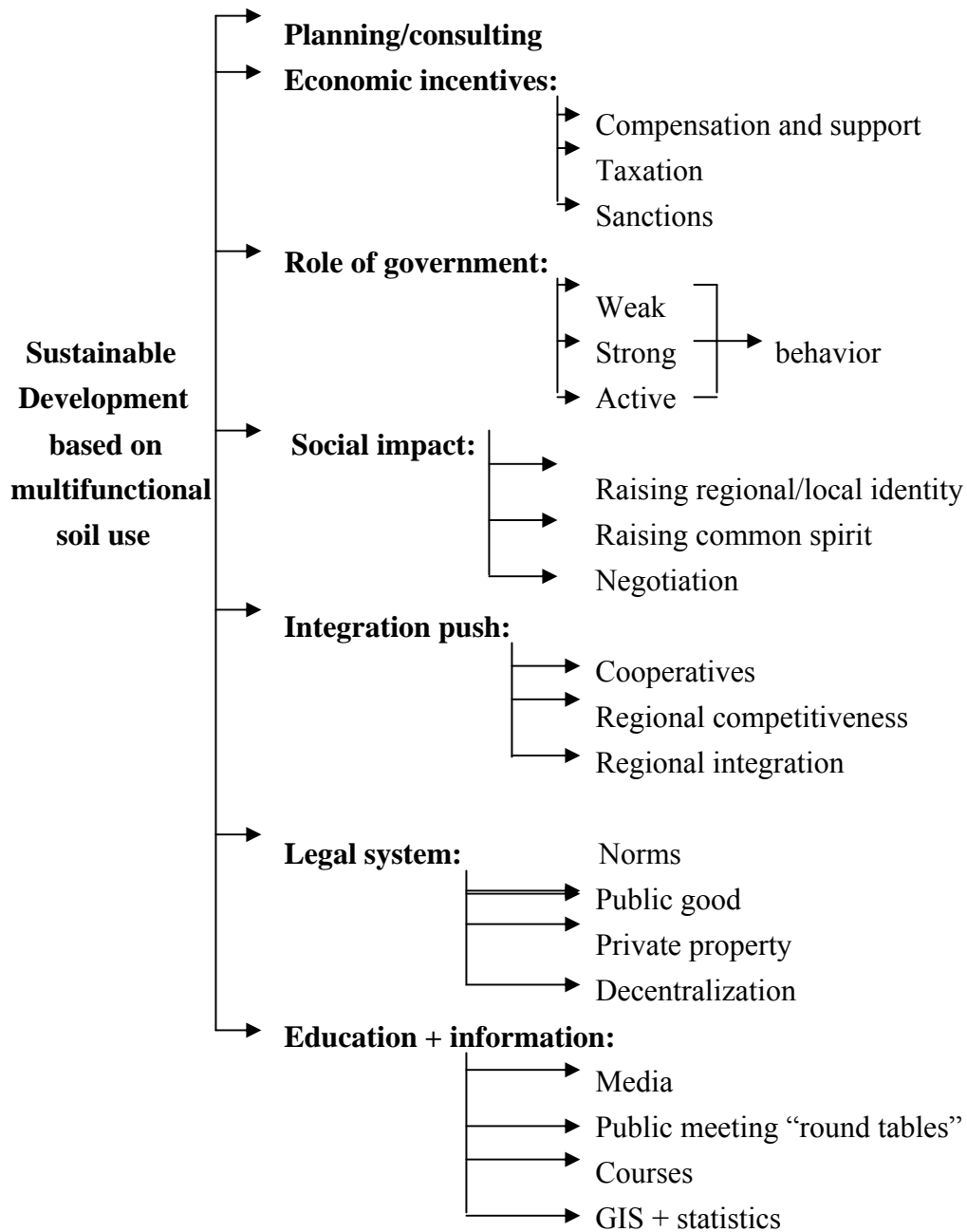
<sup>4</sup> SD is balancing the need for development and growth against the need to protect the natural and built environment while meeting the needs of the present generation without compromising the needs and aspirations of future generations

<sup>5</sup> SD is planning new development such that it makes maximum use of brownfield sites, encourages the use of public transport, discourages the use of the private car, and minimizes the impact on air quality and the local environment

<sup>6</sup> SD considers forms of development that do not deplete the land or its people. Sustainable practices are ecologically sound, economically viable, socially just and culturally appropriate

## Rural soil

*Objectives and goals:*



*Strategic priorities for sustainable land use and regional development:*

**-LOCAL-**

- \* initiation of land/soil projects
- \* negotiation of multifunctional soil use
- \* acting cooperatively
- \* integration of neighbors, stakeholders on land use problems
- \* identification through soil multiuse and its features (landscape)

**-REGIONAL-**

- \* preparing land and soil use strategies
- \* planning of scenarios
- \* consulting local level on land and soil use
- \* education on soil use
- \* social, economic, ecology issues in connection to soil

**-NATIONAL-**

- \* legal framework
- \* regional development policies about soil and land use
- \* coordination of land and soil issues

**Wilderness (Virgin natural areas)**

*Problem on the term*

Does the wilderness exist at all in nowadays Europe? Is there anything wild and untouched when technologies evolved as they are today? Is a wilderness area where people do not live or area where live a few people? Can we say that Finish lake area or Polish marshlands, including native people who live there without any innovations we are introduced to, is wilderness?

*Suggestion on term*

In this state of condition, term we should use rather than wilderness is virgin natural area. In a case of European territories we can consider virgin natural area as high mountain areas or wetlands or any other low settled area.

*Objectives and goals:*

2. To make a clear definition on wilderness term:
  - Denotation
  - Connotation

3. To identify wilderness areas:
  - Autochthonous forests
  - High mountain areas
  - Wetlands
4. Evaluation of wilderness areas:
  - Establish criteria and indicators of evaluation
  - Make taxation according to state and kind of VNA
5. Establish organization measures for wilderness protection:
  - Create institutions which are responsible for VNA
  - Zoning system
  - Monitoring system
6. Establish other measurements:
  - Financial
  - Legal
  - Economical
  - Technical
7. Education:
  - Education system (school)
  - Medias

### **CONCLUSION:**

Even any of this three areas (urban, rural, VNA) has its specific characteristics related to the soil and soil multifunctionality, there are mutual problems and approaches to their solving. Beside a range of differences in condition, existing activities and planned purposes, principals and objectives of sustainable development related to the soil are the same and mutual for all kinds of areas.

#### *Mutual objectives and goals:*

1. Creating a data-base for land and soil use
2. Practice on more than one level (local, regional, national, international) with regard to soil use
3. Instruments and measures for plan realization within the soil use matter
4. Dissemination of information on soil use through education system
5. Sustainable development and maintenance of quality and multifunctionality of the soil
6. Realization of „Learning Region” idea in relation to soil use

### **QUESTIONS:**

- 1. What is the relation of economic competitiveness in the regional development in the EU countries and soil and land use?**
- 2. Why this development issue is getting so important now?**
- 3. What should we preserve through the sustainable development of land?**
- 4. What sustainable development means as considered towards the multifunctional soil preservation?**
- 5. Which tools should the planner have to judge the degree of sustainability regarding to soil protection?**
- 6. How can the sustainable soil use influence the quality of urban living?**
- 7. How to find way to define the values of the soil within the community? (What are the preferences?)**
- 8.**

### **QUESTIONS:**

- 1. How to assign the different and dynamic zones of land and multifunctional soil use?**
- 2. How to define completeness of the landscape structures based on its multifunctional use?**
- 3. Is multifunctional soil use depending on land capacity and quality and how?**
- 4. How to achieve the use of brownfield for promoting multifunctional soil use and not for commercial use?**
- 5. How can education be achieved?**
- 6. How can we optimize GIS methods concerning multifunctional rural land use planning?**

### **QUESTIONS:**

- 1. Is sustainable treatment of VNA better than its absolute conservation?**
- 2. Can we use the same measures and instruments for VNA soil and land use planning or approach to their treatment should be unique?**
- 3. Can we consider parks, gardens and other humane made natural elements in the cities as nature?**
- 4. Is multifunctionality of VNA possible and what functions, in that case, we regard as compatible?**
- 5. Which are examples for successful and multifunctional VNA management in Europe?**

