URBAN SMS Soil Management Strategy

SWOT Analysis

Analysis of Strengths, Weaknesses, Opportunities and Threats of (policy) instruments regarding the protection of soil from the partners of the CENTRAL project “Urban SMS“

B. Bory & E. Dallhammer (Eds)
June 30th, 2009

CENTRAL EUROPE
COOPERATING FOR SUCCESS.

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

Österreichisches Institut
für Raumplanung

WP3 SWOT

analysis of Strengths, Weaknesses, Opportunities and Threats of (policy) instruments regarding the protection of soil from the partners of the CENTRAL project "Urban SMS"

June 30th, 2009

CENTRAL EUROPE
COOPERATING FOR SUCCESS.

EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND

URBAN SMS
Soil Management Strategy

Commissioned by:
Umweltbundesamt GmbH

Project team: Barbara Bory (ÖIR)
Erich Dallhammer (ÖIR)

Contributions: Isabel Wieshofer, Arthur Kanonier, Wolfgang Lexer, Manfred Schönfeld, Eckart Herrmann, Sigbert Huber (AT)
Petra Vokurková (CZ)
Marco Parolin, Mattia Biasioli, Franco Ajmone Marsan (IT)
Petra Blümlein, Siegmar Jaensch (DE)
Jaroslava Sobocká (SK)
Peter Medved, Borut Vrscaj, Tomasz Stuczynski, (SI)
Grzegorz Siebielec, Tomasz Stuczynski (PL)

Österreichisches Institut für Raumplanung (ÖIR)
(Austrian Institute for Regional Studies and Spatial Planning)
A-1010 Wien, Franz-Josefs-Kai 27 | Telefon +43 1 533 87 47-0, Fax -66 | www.oir.at

Vienna, June 2009 | ANr. 700273 | Version 4.0

CONTENTS

1. Introduction

The URBAN-SMS project collects good practice on soil management within the partner regions. Regulations, guidelines and other instruments were screened on their impact on and protection of soil. The partners collected legislations, decrees on (international), national, regional and local level, guidelines, regulations, subsidies and strategic documents or plans that consider the use and protection of the soil and its functions. Five international (EU) instruments, 81 national laws and guidelines and 48 instruments on regional and local level were screened. The instruments were classified according to their influence on the different threats of soil, as compaction, sealing, pollution, loss of organic matter and erosion.

The Key question for the analysis of Strengths, Weaknesses, Opportunities and Threats is the contribution of the instrument to best practice of soil protection:

- Is the instrument capable to influence the use of soil in an efficient and sustainable way?
- How the instrument contributes to an efficient and sustainable soil protection?

Following the analysis methodology (cf. chapter 2) the partners analysed 44 instruments (cf. chapters 3 to 10). This analysis is concluded with a conclusions chapter including recommendations (chapter 11).

2. Methodology of the SWOT analysis

The partners selected five to ten instruments they considered as either most efficient (good practice for soil management) or as instrument with potential for efficient and sustainable soil protection. Moreover, the selection aimed at covering the various types of intervention.

From each selected instrument the following guiding questions were answered.

<table>
<tr><td colspan="2">Title of instrument [Short name of instrument]
Title of instrument in original language+ short name of instrument in English language</td></tr>
<tr><td colspan="2">Short description of the instrument
Please include in the short description of the instrument the following questions resp. answers:
What are the objectives of this instrument?
Who applies the instrument and in which cases?
Is it applied often?</td></tr>
<tr><td>Status
Please indicate the status from the following list:
LEX EU
LEX nat.
LEX reg.
Nat. guideline
Reg. guideline</td><td>Type of intervention
Please indicate the type of intervention form the following list:
Goal to protect soil
land use regulation/zoning
protected areas
impact assessment
monitoring
permission
subsidy, public supply
tax regulation
others: please indicate</td></tr>
<tr><td colspan="2">Execution
Is this instrument to be applied in combination with others to result in sustainable soil protection? [e.g. an EIA is only an efficient soil protection instrument if the licensing requirements and orders are observed; goals to protect soil written down in laws are efficient for soil protection only in combination with the refusal of a building permissions, etc.]
How is the instrument executed?</td></tr>
<tr><td>Strengths
What are the strengths and advantages of this instrument or this instrument in combination with others?
What are the strengths as regards soil protection?
How does it contribute to soil protection?
Which aspects of soil protection (compaction, sealing, pollution, loss of organic matter, erosion) are covered?
For which types of impact (compaction, sealing, pollution, loss of organic matter, erosion) does it function well? Why?
Other strengths?</td><td>Weaknesses
What are the weaknesses and disadvantages of the instrument?
What are the weaknesses as regards soil protection?
Which aspects of soil protection (compaction, sealing, pollution, loss of organic matter, erosion) are not covered?
For which types of impact (compaction, sealing, pollution, loss of organic matter, erosion) the instrument is less suitable? Why?
Other weaknesses?</td></tr>
<tr><td>Opportunities
What is the development potential of this instrument to become a good practice instrument for soil management and protection?
Is there potential for enhancing the effectiveness of the instrument?
For which types of impact (compaction, sealing, pollution, loss of organic matter, erosion) the instrument is or could be a good practice instrument?
What can be achieved with the instrument for soil protection?</td><td>Threats
Which are the threats in developing this instrument into a good practice instrument for soil management and protection?
Could there be problems in effectiveness?
Could there be problems of acceptance?
What could happen to soil if the instrument is not applied (properly)?</td></tr>
<tr><td colspan="2">Conclusions
Is the instrument a best/good practice instrument?
What are recommendations for the further development/appliance?
Please indicate and justify your assessment of the instrument:
Assessment: Not adequate for soil protection/best practice instrument/good practice instrument/instrument with development potential, because …</td></tr>
</table>

3. Overview on analysed instruments

The partners analysed 43 instruments, which can be summarised in six groups. The following table provides an overview on the analysed instruments described in detail in the following chapters. Conclusions are summarized in the last chapter 11-Conclusions starting at page 67 of this document.

The single groups are described in chapter 11.1, some of the best practice elements are described in chapter 11.2, page 68 ff.

	Spatial planning and building legislation	Soil protection acts	Nature protection, water and forest acts	Acts for agricultural land	SEA/EIA	Subsidies/Penalties	Best practice elements described in chapter 11.2	
43	9	12	12	4	4	3		Number of instruments
Austrian Instruments								
				(x)		x		Agricultural Subsidies (Rural Development Programme)
		x						Alpine Protocol "soil conservation"
					x			Environmental Impact Assessment (EIA)
			x					Nature Conservation Law (permissions within protected areas)
		x					x	Soil Enhancement Plan
	x							Spatial Planning and Building Legislation (soil sealing limitation)
					x			Strategic Environmental Assessment (SEA) according to the Spatial Planning and Building Legislation
	x							Development Program (rules for the land use plan)
						x		Housing Subsidy
Czech instruments								
					x			Environmental Impact Assessment
			x					Environmental law
			x					Act on protection of agricultural land resources
German instruments								
	x							Spatial planning and Building Legislation
		x						Federal Soil Protection and Contaminated Sites Ordinance
		x						Soil Protection and Contaminated Sites Act
			x					Nature protection Act and Nature protection Act
		x					x	Guideline for the assessment of soils according to their performance
			x					Guideline for the environmental compartment soil in the compensation regulation

	Spatial planning and building legislation	Soil protection acts	Nature protection, water and forest acts	Acts for agricultural land	SEA/EIA	Subsidies/Penalties	Best practice elements described in chapter 11.2	
Italian instruments								
			x		(x)			Single Act (Law) of the Environment/Law in environmental matter
			x					Additional rules in environmental matter
	x						x	Guidelines for provincial assessment on compatibility of municipal planning tools with the Provincial Land Coordination Plan
	x							Implementation norms – present, Plan of rules – forecast
	x						x	Building Regulation of the Municipality of Milan
		x						Rehabilitation of Polluted Sites in the Piemonte region
		x						Alpine Convention
Polish instruments								
		x						The law on environmental protection
				x			x	The law on agricultural and forest land protection
		x						The decree of Ministry of Environment on soil quality standards
			x					The law on environmental damages and their alleviation
		x						The law on excavation wastes
Slovakian instruments								
				x				Law on protection and use of agricultural soils and about integrated prevention and control of environment pollution
						x	x	Decree of determined amount of payment and specification of payment for agricultural land consumption
					x			Law on impacts assessment on environment
				x				Law on protection and use of agricultural soils (re-cultivations)
	x							Regulation urban zoning and planning and its documentation
			x					Regulation on land protection at urban planning and zoning and at consumption and forest land functions restriction
Slovenian instruments								
	x							Decree on Spatial order of Slovenia
			x					Environmental Law
	x							Spatial planning Act
			x					Water act
		x						Decree on burdening of soil
		x						Decree on the limit input concentration values in soil
				x				Agricultural Land Act

4. Austrian Instruments

In Austria eleven instruments with regulations regarding soil protection were identified on national level and 22 for the federal provinces Salzburg, Upper Austria and Vienna. Nine instruments were selected for the SWOT analysis.

The selection of instruments for the SWOT analysis comprise:

1. Agricultural subsidies (Rural Development Programme)
2. Alpine Convention – Protocol on Soil Conservation
3. Environmental Impact Assessment (EIA)
4. Nature Conservation Law of Vienna (permissions within protected areas)
5. Soil Enhancement Plan (Upper Austria)
6. Spatial Planning and Building Legislation (soil sealing limitation – Vienna)
7. Strategic Environmental Assessment (SEA) according to the Spatial Planning and Building Legislation (Vienna)
8. Development Program Salzburg (rules for the land use plan)
9. Housing Subsidy (Salzburg)

4.1 Subsidies for land use according to the Rural Development Programme 2007-2013 Austria – ÖPUL

Landwirtschaftliche Förderung, insb. Österreichisches Programm für die Entwicklung des Ländlichen Raumes 2007 – 2013

Short description of the instrument

Objective:

The main objectives of the Austrian Rural development programme 2007-2013 are

- income stabilisation in less favoured areas
- farm income component for common services and goods
- improving competitiveness for farming and forestry
- environment and countryside conservation and improvement
- improving quality of life and diversification of the rural economy

To meet the objectives the agri-environmental programme (ÖPUL – Österreichisches Programm für umweltgerechte Landwirtschaft) as part of the rural development programme measures was set up. With the ÖPUL programme subsidies are paid for compensation for environmental management services in the fields "soil protection", "protection of surface and ground water", "air pollution prevention and climate protection", "conservation and improvement of biodiversity" and "conservation of traditional cultural landscapes", which go beyond the legal compliance; especially in the fields of reduction of pest and fertiliser inputs, environmentally friendly agriculture (28 sub-measures in total).

Application:

Farmers or legal bodies (agricultural co-operations) apply for subsidy for their measures.

The instrument is voluntarily for farmers and applied often. Applications for subsidy can be turned in periodic at the Federal Ministry of Agriculture, Forestry, Environment and Water Management.

Status	Type of intervention
LEX nat basing on LEX EU	Subsidy (incentive and compensation)

Execution

In case they plan enhancement or omission measures in terms of ÖPUL farmers apply for subsidies in filling in an application form. After implementation the execution of the measures are monitored.

The money comes from the state or the federal states co-financed by the EU.

Strengths	Weaknesses
Subsidies guide directly. Therefore the instrument itself is effective. Implementation is monitored quite strictly. Subsidised measures for soil protection respectively for the optimisation of agricultural production are e.g. greenery of areas no longer used for agricultural production, conservation of areas in sufficient agronomic condition, protection of terraces, maintenance of grassland, organic farming, soil erosion caused by water, river and lake protection, etc.. Main aspects of soil protection: reduction of pollution, loss of organic matter, erosion, compaction are concerned. Does mainly counteract indirectly loss of organic matter, erosion by incentives.	High costs Restricted to agricultural land Compaction is covered only indirectly (by the fact that the concerned area is agricultural land). The objective of the instrument is not long lasting soil protection. The positive effects on soil can change rapidly if the programme of the upcoming period targets other objectives. Many measures are conceived in a multi target framework. Compromise between economic and environmental targets leads to less efficient outcome.
Opportunities	**Threats**
The instrument can be extended by more soil protection objectives and measures if the agricultural ministry and further representations of interests agree on a common strategy. A measure could be the interdiction of all activities and substances harming soil, linked to penalties. The instrument is a good practice instrument for lower pollution, reduction of loss of organic matter and to counteract erosion.	Conflicts of monetary interests between representations of interests and public requirements. (Monetary) guiding measures can also bring unwished effects. Prohibition of harmful substances will not be accepted by some representations of interests. Political dependencies if farmers get used to subsidies. Strong dependency from EU policy

Conclusions

The instrument can be extended by more soil protection objectives and measures and is a good, comprehensive instrument with an excellent (monetary) guiding effect.

4.2 Alpine Convention – Protocol on Soil Conservation

Protocol on the Implementation of the Alpine Convention of 1991 in the field of Soil Conservation, respectively: Bundesgesetzblatt 2002/235. Protokoll zur Durchführung der Alpenkonvention von 1991 im Bereich Bodenschutz (Protokoll „Bodenschutz")

Short description of the instrument

Objectives:

Conservation of soil functions in quality and quantity, setting measures against soil erosion, compaction and contamination, preservation of diversity of typical soils in the Alps.

If there is a risk of serious and sustained damage to the functionality of soils, protection shall, as a matter of principle, be given priority over utilisation. (art. 2(2))

It contains single contents respectively protection regulations:

- Conservation of soils in wetlands and moors
- Designation and management of Alpine areas threatened by erosion
- Agriculture, pasture farming and forestry
- Silvicultural and other measures
- Limiting inputs of harmful substances
- Contaminated soils, environmental liabilities, waste management concepts

When assessing the spatial and environmental compatibility of large-scale projects in the fields of trade and industry, construction and infrastructure, especially in the transport, energy and tourism sectors, soil conservation and the scarcity of space in the Alpine region shall be taken into account within the framework of the national procedures. (art. 7 (3))

Application:

The Alpine Convention Protocol "soil conservation" has to be applied/implemented by the national states.

Status	Type of intervention
LEX nat (resp. guideline on transnational level)	Goal to protect soil

Execution

The Alpine Convention goals for soil protection are put through mainly within the EIA procedure, which means they are linked to the realisation of large-scale projects in the fields of trade and industry, construction and infrastructure.

The Alpine Convention foresees the establishment of permanent monitoring areas and coordination of environmental monitoring.

Strengths	Weaknesses
Instrument explicitly for soil protection. Covers the whole Alpine space and not only agricultural land or protected areas, as most of the other national or state laws do. Comprehensive catalogue of objectives and measures regarding soil protection. All aspects of soil protection (compaction, sealing, pollution, loss of organic matter, erosion) are covered. The soil protection goals are considered in allowance procedures following the EIA law, water law, forest law, nature protection law and building permission procedures. Measures against pollution, loss of organic matter and are covered in a comprehensive way. As the instrument is applied in combination with Environmental Impact Assessments, it also covers sealing and compaction.	The Alpine Convention encounters a lot of laws and rules with different targets. The practical relevance cannot be appraised easily. The goals and measures are of declarative character and only partially directly applied. The goals are considered mainly in permission processes or impact assessments. Monitoring is regulated as follows: 1. The Contracting Parties undertake to establish permanent monitoring areas in the Alpine region and to integrate them in an Alpine-wide soil monitoring network. 2. The Contracting Parties agree to coordinate their national soil monitoring programmes with the environmental monitoring programmes for air, water, flora and fauna. 3. Within the framework of their monitoring programmes, the Contracting Parties shall establish soil sample databases according to comparable parameters. The implementation and performance of monitoring depends on the single authorities. In four out of nine Austrian Federal States there are no adequate laws for soil protection. Monitoring reports make clear that not all goals were put into practice so far. There is still need for the implementation of single measures.

Opportunities	Threats
Concerning soil protection the instrument quite comprehensively covers all types of impact on soil. The weakness is the implementation and performance of monitoring that depends on the single authorities. So by ratifying the document each state has the opportunity to lay down its commitment to the goals of the Alpine Convention Protocol "soil conservation". Furthermore, the implementation of the monitoring measures would help to establish a information system about the development of soil. Thus, the Alpine Convention Protocol "soil conservation" could become a strong instrument for soil protection.	If the Alpine Convention Protocol "soil conservation" is not ratified with binding implementation, execution and monitoring measures, Austria will stay without an instrument explicitly pushing soil protection. As usual, if laws are made more rigorous, acceptance problems arise. There will be collisions of interests between the soil protection lobby and other lobbies such as land users. If the instrument will not be foreseen with the necessary binding execution and binding regulations it will stay ineffectively.
Conclusions	
Good practice instrument in terms of relevant goals and the necessity to establish a monitoring system. Would be best practice instrument, if monitoring and execution would function stricter.	

4.3 Environmental Impact Assessment (EIA) – for large scale projects

Umweltverträglichkeitsprüfungsgesetz 2000 – UVP-G 2000

Short description of the instrument

The purpose of an environmental impact assessment (EIA) shall be, with public participation and on a basis of expertise,
1. to identify, describe, document and assess the current state as well as direct and indirect effects that a project will or may have on [...] soil [...], including interactions of several effects.
2. to examine measures that prevent or mitigate harmful, disturbing or adverse effects of a project on the environment or that enhance its beneficial effects,
3. to document the advantages and disadvantages of the alternatives examined by the project applicant as well as the environmentally relevant advantages and disadvantages of not proceeding with the project, and
4. to document the environmentally relevant advantages and disadvantages of the alternative sites or routes examined by the project applicant in case of projects for which the law foresees compulsory purchase.

The national resp. regional authorities apply the SEA frequently.

Status	Type of intervention
LEX nat.	impact assessment

Execution

The EIA is combined with procedures for gaining permissions as e.g. infrastructure projects, urban developments. A positive EIA implies in principle the grant of all permissions that are relevant for the further development of the project. The developer prepares an environmental impact statement (EIS), which includes the assessment of the effect of the project to soil (as one of the required environmental media in EIA). Several reviewers assess the EIS, which is also available for the public to review and comment on the project. The results are presented in a public hearing. Finally the responsible authority decides upon the application for the permission taking the result of the EIA into account. In principle a negative statement of the EIA will lead to a denial of the project.

Strengths	Weaknesses
Framework for assessment of the impact of planned projects on all aspects of soil protection (compaction, sealing, pollution, loss of organic matter, erosion). Possibility to improve the project in order to reduce the impact on soil by setting up measures that prevent or mitigate harmful, disturbing or adverse effects of a project. The impacts on the environment are regarded already in the planning phase of the projects due to the implementation of criteria catalogues for projects influencing the environment and numerous permission, appraisal, etc. procedure regulations. This is a positive effect since the implementation of Environmental Impact Assessments. The administration has already a quite long lasting experience in implementing EIA (since 1994).	Only large scale projects that meet certain thresholds are assessed. Assessment of impact on soil is made sometimes very formal. There is no technical standard for assessments of the impact on soil, only guidelines; e.g. percentage of sealed surface is not assessed, functions of soil are not evaluated. What lacks is the enforcement to use the guidelines. Measures do not have to be implemented obligatorily, so the assessment does not necessarily deliver practical results. In four out of nine Austrian Federal States there are no adequate laws for soil protection. The Alpine Protocol "soil protection" goals (c.f. table 4.2) are mostly not included into the assessment. Often there is no evaluation of the soil status and no security of evidences. Threshold values: Projects are partly planned in a way to just not exceed the thresholds, to avoid the procedure of an EIA. On the other hand, some of the projects are planned bigger than necessary to have the permission of a potential enlargement of the project "in stock". Within the EIA procedure only one project scenario is turned in and assessed. No comparison with other suitable projects is possible like in the SEA process.
Opportunities	**Threats**
Extension of the EIA process with the assessment of the functions of soil. Obligatory use of the guidelines and "good practice" elements. If the project already went to a SEA the results should be integrated which additionally should reduce the length of an assessment procedure. Changing the threshold system (lower thresholds, expansion of propitiations)	Reliance on political goodwill and lobbies. EIA could be miss-used as steering instrument for soil consumption (Nevertheless it is no steering instrument, as the framework of evaluation is defined). Consideration of interests if more than one subject of protection is endangered.

Conclusions

THE EIA is an instrument for the assessment of the impact of large scale projects on the environment and consequently on soil. The linkage to the grant of permissions that are essential for the further development and the possibility to set up measures that prevent or mitigate harmful, disturbing or adverse effects of a project makes it rather efficient. However, especially the assessment of the impact on soil is often treated rather formal. It is a good practice instrument, because the impact on soil is assessed systematically (at least for large scale projects), but the quality of soil assessment is very heterogeneous and demands concrete obligatory regulations.

4.4 System of protected areas and relevant permissions according to the Nature Conservation Law of Vienna

Wiener Naturschutzgesetz LGBl. für Wien Nr. 45/1998 in der letztgültigen Fassung

Short description of the instrument

The Viennese Nature Conservation Law serves for the protection and maintenance of nature in all forms as well as the preservation of ecological functions by setting necessary maintenance, replenishment and rehabilitation measures. Besides the ecological functions it regulates protection of species, plants, landscape parts, fossils, minerals, natural monuments, etc.

In different kinds of protected areas various interventions are prohibited or needs permissions.

Following interventions in Green Land need permission (§ 18. (2)):

1. (changes, construction of) streets
2. building places > 2.500 m²
3. pipelines
4. surface changes > 1.000 m²
5. power lines
6. interventions in wetlands or edges of water bodies
7. cutting down alleys
8. building under surface > 300m ²

Following interventions in Protected Landscapes Parts need permission:

1. exploitation of natural resources
2. streets
3. surface changes > 1.000 m²
4. buildings
5. building under surface > 300m ²

In Nature Protection Areas all interventions (with some exceptions) need permission. For the protected areas European Protected Areas, Nature Protection Areas, Protected Landscapes, Protected Landscape Parts the state government has to enact maintenance and enhancement plans.

Application:

The Nature Protection Authority (Environmental Department of the Municipality of Vienna) applies the law. Planned interventions have to be applied for. After the permission is enacted and the intervention is implemented the Nature Protection Authority monitors the intervention.

Status	Type of intervention
LEX reg	Zoning, combined with permission

Execution

The state government issues different kinds of protected area. Various interventions need permission. The state government decrees and enacts permissions when applied for.

Smaller interventions need only be reported to the Nature Protection Authority.

Permissions can either be refused or linked to compensatory measures for soil protection.

Strengths	Weaknesses
The law stipulates comprehensive protection and maintenance of nature – in all forms – which comprises soil. By distinguishing different protection categories, protection and maintenance measures are regulated differently depending on the vulnerability of the area. There are three levels of protection and maintenance measures depending on the type of area (protected area, green land, whole city). Various interventions within green land or protected areas need to a special permission. Interventions harming soil can be prohibited. After the implementation of permitted interventions the authority monitors (once), if the undertaken interventions differ from the permitted ones. In case of interventions that were not covered by the permission the authority decrees rehabilitation measures. In green land (= non-building-land) most compaction and sealing measures are prohibited anyhow. In addition nature protection law covers pollution, loss of organic matter and erosion.	The monitoring of the interventions is conducted just once, after the finishing of the project. The instrument is not explicitly enacted to protect soil but to protect ecological balance where soil is a part of it. The necessity to apply for an allowance is restricted to green land or protected areas. Therefore the regulation does not cover the complete territory of the city. The aspects of soil protection are covered indirectly. Build up area (= compaction and sealing) is not covered. Protected areas are not everywhere, where protected goods are endangered. Enacting protected areas is depending on political interests. Whether a permission is required or not, is not depending on the soil use but on the level of protection. Penalties in case of delinquency are too low.

Opportunities	Threats
A possible enhancement opportunity is the extension of the nature protection law with more explicit soil protection regulations. Soil could be integrated more comprehensively into the protection categories and permission necessities. Expansion of permission duties respectively focussing more explicitly on goals to protect soil. Compensatory measures could be integrated that foresee compensation of soil consumption. Raising penalties in case of delinquency. Awareness rising among the population for protected area.	More severe regulations would cause acceptance problems. Pressure on ecological valuable areas is increasing due to the closeness to dense urban areas. Spatial planning instruments could not encounter this pressure.
Conclusions	
Manifold differentiated instrument for nature protection that includes soil. Through the regulations an essential contribution to quantitative and qualitative protection of soil is guaranteed. Good practice instrument, because the protection goals are assessed and monitored in the approval procedure	

4.5 Soil Enhancement Plan according to the Soil Protection Act of Upper Austria

Oö. Bodenschutzgesetz 1991. LGBl.Nr.63/1997, zuletzt geändert mit LGBl.Nr. 100/2005

Short description of the instrument

The Soil Enhancement Plan aims at setting up measures laid down in a soil enhancement plan if the thresholds for soil-quality are exceeded.

Measures for soil enhancement (§ 27):

(1) the authority is entitled to ask the land user to deliver a plan containing soil enhancement measures if
   1. the thresholds of soil measurements are extended or any other negative impact on soil is identified such as erosion or compaction
   2. enhancement of soil quality is necessary

(2) the land users plan shall include measures for soil enhancement for soil sanitation within a determined period

(3) soil enhancement plans for agricultural land are to be elaborated together with the Chamber of Agriculture of Upper Austria. They have to include concepts for soil treatment, handling of fertilizers and crop rotation.

(5) soil enhancement measures could be
   - crop rotation
   - technical measures to enhance soil structure
   - usage of less harming machines
   - limitation of fertilizers
   - planting of shrubs or windbreakers
   - …

Status	Type of intervention
LEX reg.	Plan for soil enhancement measures

Execution

Implementation following § 27 (1) to (5) is hardly executed.

The reason therefore is the establishment of a legally implemented soil protection consultation centre. Persons concerned are informed before their interference. Within the information less harming solutions for planned interventions are elaborated. Up to now such activities were undertaken to counteract erosion problems.

Strengths	Weaknesses
The implementation of the Soil Enhancement Plan could lead to restriction of use or even to the ban of soil usage (§28). Above that the establishment of sanitation areas is possible (§27 (6)). The law of Upper Austria addresses all soil users independently from land use. The step-wise elaboration of soil enhancement plans allows an optimised collaboration with the users, as they are obliged to propose their own soil enhancement measures, which allows maximal flexibility.	The quality of soil is not explored in cases where thresholds are missing. The Soil Enhancement Plan is rarely executed.
Opportunities	**Threats**
Cheap implementation and integration of users leads to high acceptance.	No threats, if adapted to changing situation (climate change, etc.)

Conclusions

Assessment:

Best practice instrument because the Soil Enhancement Plan is an instrument suitable for threshold exceeding and other negative impacts on soil health. However, it is rarely executed.

4.6 Spatial Planning and Building Legislation of Vienna Particular legal regulation concerning soil sealing

Bauordnung für Wien LGBl. für Wien Nr. 11/1930 in der Fassung Nr. 24/2008

Short description of the instrument

The building plan serves for convenient building development by determining the urban pattern.

It contains regulations concerning building placement, sizes, heights and design criteria.

It includes one particular legal regulation concerning soil sealing: In dense areas 10% of building land must stay unsealed. In less dense areas only one third of the building land must be sealed.

The instrument is applied very often (~ 200 times per year).

Status

LEX reg resp. LEX loc

Type of intervention

land use regulation/zoning – Direct legal force that applies to any building site

Execution

When a developer applies for building permission, the building authority evaluates the request, approves the project and monitors the execution.

Strengths

The Viennese building plan is the main instrument to regulate any kind of building (territorial arrangement and design). As it has a long-lasting tradition, the applicants are used to its regulations.

It has comprehensive possibilities to constrain soil consumption by regulating the building lines per building plot.

In the building plan procedure the objectives of the building law are counterchecked. One of the objectives is the sparsely use of soil (§1). It leads to obligatory planning of free spaces and is limiting soil consumption indirectly.

Furthermore, it includes a threshold for maximum sealed surface within dense and less dense areas (infiltration objective) that is counterchecked. Only one third of a building lot is allowed to be obstructed. On building lots > 500m² 10% must remain unsealed.

The instrument is applied frequently. The building authority monitors the construction.

Weaknesses

The construction law restricts only sealing through buildings that need a building permission. The regulations are not applicable to the sealing of public space respectively streets.

The building scheme is no explicit instrument for soil protection but contributes to soil protection as it limits the sealing of surfaces. The constitution of the unsealed area is not determined.

The value for unsealed soil is defensively low, still it determines sealing of inner-city areas.

The instrument is not suitable for the prevention of pollution, loss of organic matter or erosion.

Sealing is monitored only once – directly after the building is finished.

Opportunities

The instrument is suitable for limitation of compaction and sealing.

One potential is to increase the value for unsealed areas especially on not built but sealed areas like large squares and parking lots.

An additional development potential would be to sharpen monitoring, for example with the monitoring via a satellite based GIS or with the instrument of green space monitoring based in IR slides.

A soil protection expert especially in field of high quality soil should be involved in the enactment of building schemes.

Threats

More severe regulations would cause acceptance problems of landowners and developers that need to develop their land in a very economic way.

Conclusions

The instrument together with the evaluation of the building authority is a controlling instrument.

Additional contents and more severe regulations could enhance the soil protection character of the instrument.

Thus, it is an instrument with development potential, because the construction law is a established instrument for urban development. It can contribute to enhance the integration of soil sealing monitoring in the building process.

4.7 Land Use Plan including Strategic Environmental Assessment (SEA) according to the Spatial Planning and Building Legislation of Vienna

Wiener Bauordnung LGBl. für Wien Nr. 11/1930 in der Fassung Nr. 24/2008

Short description of the instrument

The construction law of the city of Vienna regulates spatial planning and construction in one law, as Vienna is a Federal State as well as a municipality.

The objectives are not primarily soil protection but to regulate zoning and construction. The Land Use Plan objectives include important objectives for soil protection. Examples therefore are:

§1 (2) 4: conserve respectively obtain a liveable surrounding, especially for living, working and recreation under predomination of a sparingly ecological sustainable use of natural resources such as soil.

§1 (2) 6: safeguarding (named) recreation areas

Regarding spatial planning and zoning urban planners (employees of the spatial planning department of the municipality) apply the regulations. Before a zoning plan is enacted it has to pass several board decisions.

In the following cases a SEA with an environmental report have to be elaborated:

- If the Land Use Plan would allow a project that have to be assessed following the EIA law
- If a protected area of European importance is affected
- If the plan or programme fulfils criteria following the annex II of 2001/42/EC guideline (assessment of the effects of certain plans and programmes on the environment)

An environmental report has to describe the likely significant effects on the environment of implementing the plan or programme. Thereby, reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, have to be identified, described and evaluated (2001/42/EC art. 5 (1)).

The Municipality has to check together with the environmental agency (Wiener Umweltanwaltschaft), if a SEA is obligatory. If no SEA has to be made the environmental agency and the Environmental Department of the City of Vienna have a voice in the planning process.

The overall objective of the SEA is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of the land use plan and the building scheme with a view to promoting sustainable development.

The planning authority of Vienna, Magistratsabteilung 21, applies the instrument.

Status	Type of intervention
LEX reg based on LEX EU	impact assessment

Execution

The SEA is applied as a part of the planning procedure of the enactment of the Land Use Plan in Vienna. The municipality elaborates a proposal for the Land Use Plan under predomination of a sparingly ecological sustainable use of natural resources such as soil. In addition the determinations of the city development guideline (STEP 05) are considered in the planning/approving procedure. (For large scale urban developments (bigger 10 hectare) an EIA has to be conducted.)

In the environmental report the likely significant effects on the environment, including on issues such as soil are assessed. The result of the SEA is made available to the public.

The first SEA step is screening the environmental characteristics of areas likely to be significantly affected. The environmental agency (Wiener Umweltanwaltschaft) comments the screening. If significant environmental problems are identified the assessment procedure proceeds. All concerned municipal departments can turn in written comments.

In Vienna were last year about 200 Land Use Plan changes and thereof two SEAs executed.

Strengths	Weaknesses
Assessment already in planning stadium	The construction law as such is not created as instrument for soil protection.
Soil protection is an objective in the Land Use Plan procedure and is monitored by the Environment Department.	Administration and politicians fears to implement the SEA because of the long duration of the assessment procedure.
All aspects of harming soil are covered principally (compaction, sealing, pollution, loss of organic matter, erosion)	Only measures that can be influenced by the Land Use and Building Plan can be implemented.
The results are made available to the public.	No obligation to set measures.
Measures to encounter negative impacts can be displayed.	Decisions are depending on different (political) views.
All modifications of the land use plan go through the screening procedure.	Lack of capacity of environmental agency.
The soil protection delegate can react actively to each project or programme.	No long tradition of instrument.
Impact on soil is definitely checked for any plan by experts	The SEA is applied rarely.
About 70% of the comments from the environmental agency were included in the further planning process (even without SEA).	Sealing is monitored only once – directly after building and only on sites more than 600m^2.

Strengths	Weaknesses
The land use plan is applied frequently. The building authority monitors the construction. Assessment of the plan is compared to the effects of alternative solutions.	
Opportunities	**Threats**
Efficient soil saving measures are compiled in a legally enacted plan. Determination of assessment standards. After the long-lasting Strategic Environmental Assessment procedure the EIA procedure could be speeded up.	Not applied regularly because of missing political acceptance. High controlling effort also for small impacts.
Conclusions	
The SEA of the Land Use Plan is a good possibility to include soil protection in the earliest possible stadium – the planning stadium. The Land Use and Building Plan can determine directly soil consumption respectively sealing. The Instrument is rarely implemented because of the long duration of the assessment process. Assessment: The SEA is in principle adequate for soil protection at an early planning stage, but very rarely applied.	

4.8 Development Program Salzburg – rules for the land use plan

Salzburger Landesentwicklungsprogramm 2003

Short description of the instrument

2003 the Federal State of Salzburg has enacted a development programme with the main objectives of compact settlements with clearly defined edges and the sparingly and economically sustainable use of land laying down concrete measures therefore.

The concept of a sustainable land use aims at a sparsely and modest use of soil. Therefore, housing and the development of settlements need to focus on land saving developments. This approach contributes to enlarge the scope for possible future unforeseeable developments.

The Development Program Salzburg includes amongst others the following rules for municipalities, concerning the content of the land use plan.

- When calculation the need for new building land the municipalities have to consider the regional context and the development of the size of the households.
- The future development of the settlement has to take into account ecological criteria.
- Future developments of settlement should be directly connected to existing settlements.
- Zoning of building land outside the catchment area of public transport needs a special justification.
- Within the catchment area of public transport densely populated areas shall be developed.

Measures for landscape protection, nature protection and keeping green areas open are included such as:

- Clear definition of settlement edges on supra local level
- Protection of important landscape connections on supra local level
- Keeping bigger green areas unsealed

Status	Types of intervention
LEX reg./Lex loc	land use regulation/zoning

Execution

The municipalities enact the land use plan according to the rules of the Development program of Salzburg. The state government has to approve the land use plans. Thus, it can check, if the municipalities apply the rule set up in the Development Program of Salzburg. Any building permission has to be in line with the land use plan.

Strengths	Weaknesses
Aim of compact settlement development (and high quality of transport) reduces soil consumption. Basic principles and objectives of the spatial planning law are broken down to concrete measures including the nomination of stakeholders for the implementation of the relevant measures. Different planning concerns are harmonised – especially those concerning environmental protection. High commitment and long binding to the law. Limitation of the scope of (administrative) discretion.	Soil protection is treated only indirectly. Though the objectives and measures are comparatively concrete, counteractions are minor. Minor effect on lowering building activities. Land use planning is still in the scope of (administrative) discretion, driven by local policies and depending on the monitoring quality of the federal government.
Opportunities	**Threats**
Instrument to support the local planning effort to gain compact settlement development following the principle of resource and soil saving. Monitoring by the federal government strengthens the implementation of local planning goals. Subsidies, planning of spatial patterns or building allowances could be better linked to soil saving measures.	Missing political acceptance. Conflict of interests land use versus soil protection. Conflict of interests in releasing comprehensive plans on state level.

Conclusions

The land use plan is in principle an adequate instrument to influence the use of land and consequently soil sealing. The regulations enacted in the development program of Salzburg contribute to the reduction of land use and to reduce urban sprawl. However, the impact is limited to those buildings for which a building permission is required. A strengthening of the application of the land use plan would improve its effectiveness on soil sealing as well.

4.9 Housing Subsidy for the state of Salzburg

Salzburger Wohnbauförderungsgesetz 1990

Short description of the instrument

Objectives:

The subsidies should enable the inhabitants of the Federal State of Salzburg to get living space in good and healthy quality.

Soil protection is not the explicit goal of the Housing Construction Subsidy. Still soil protection objectives are indirect content, such economic soil consumption (§ 1 (3)). Subsidy is higher for modification or extension of existing buildings than for new buildings (1.150 € subsidy per m^2 net floor instead of 1.000 € for the construction of new buildings).

Application:

in many cases of building, sanitation and purchasing homes by individual persons, municipalities, non-profit-making building co-operations

Status	Type of intervention
LEX reg.	subsidy, public supply

Execution

The Housing Subsidy supports the building or renovation of buildings (subsidy for objects) as well as households with less economic power (subsidy for subjects). For soil saving the first kind of subsidies are relevant.

Applicants turn in their application at the state government. The state government evaluates the application. In case of positive evaluation the applicant receives a subsidy in form of a mortgage, credit or grant.

Strengths	Weaknesses
Applicants stick strictly to the directive to receive subsidy. The directive guides directly. Regarding compaction and sealing the subsidy has direct guiding possibilities. The state government can decide on the project. Subsidy for building new homes is provided only in case of economical use of land and up-to-date forms of housing. Determining the form and surface of the building influences compaction and sealing. The Housing Subsidy sets incentives for sparingly use of soil. The subsidy is much higher for dense development compared to single-family housing. Higher support of renovation: Subsidy is higher for modification or extension of existing buildings than for new buildings. There is an extra subsidy for ecological building or renovation.	To regulate everything by means of subsidies would cost too much. In case of housing – especially in the time of financial crisis – subsidies are necessary and do have a long tradition. The housing subsidy as such is not created as instrument for soil protection and therefore in includes soil protection in negligible way. For the remaining plot of land no regulations regarding pollution, loss of organic matter, erosion are determined. Housing subsidy follows different goals partly contradictory. Still subsidised sanitation does not have a high priority; 2006 only 30% of the subsidies were used for sanitation.
Opportunities	**Threats**
Development potential is given and depending on the intention of the state governments intention to use this instrument as an instrument for soil protection. Development potential is seen as regards compaction and sealing, as it is an instrument guiding the building process. One potential is to increase the value for unsealed areas. With housing subsidy the forms, efficiency, ecologically of housing could be guided much more future oriented and sustainable.	Housing subsidy cannot compensate deficits of land use planning. Housing subsidy supports as well projects with less positive impacts.

Conclusions

Good practice that could be best practice, if the regulations would include severe regulations for soil protection.

Instrument with development potential, because subsidy guides directly and could be enhanced with more soil protecting regulations.

5. Czech instruments

In the Czech Republic 20 instruments were identified on national level. Three instruments were selected for the SWOT analysis.

The selection of instruments for the SWOT analysis comprises:

1. Environmental Impact Assessment
2. Environmental law
3. Act on protection of agricultural land resources

5.1 Environmental Impact Assessment

zákon č. 100/2001 Sb. O posuzování vlivů na životní prostředí

Short description of the instrument

impact assessment of proposed activities on soil in relation to the environment

Objectives:

– Determination of concrete building structure or another project are influencing environment and population
– Under what conditions is the implementation acceptable

Appropriate authorities for environment of state administration applies this Instrument:

In case of developing factories, incinerators, highways...

This instrument is applied on daily basis

Status	Type of intervention
LEX EU	impact assessment

Execution

An EIA is only an efficient soil protection instrument if the licensing requirements and orders are observed. EIA is in Czech republic implemented by the law no. 100/2001 coll. named Environmental Impact Assessment.

Appropriate authorities of state administration are considering the recommendations of EIA output within the decision making process.

Strengths	Weaknesses
The process is public free via internet since the very start. All suggestions and notes are being considered.	Due to the appropriate authorities jurisdiction at the starting up process the instrument became less powerful.
Besides the current status of inflicted location and direct impacts there is being evaluated influences incurred during preparation works or in example possible cancelling of the project	Appropriate authorities of state administration are considering only the recommendations of EIA output within the decision making process. The decision is not strictly tight to the EIA outputs.
Due to the appropriate authorities jurisdiction at the starting up process the instrument became flexible.	Some building structures mentioned in the law annex are being excluded from the required EIA process.
Sealing, pollution, loss of organic matter and erosion aspects of soil protection are covered.	The instrument is not applicable directly to soil protection besides the other environment aspects.
Opportunities	**Threats**
There is potential of this instrument to become a good practice instrument for soil management and protection by accepting the EIA outputs as mandatory acts.	There are possible threats in developing this instrument into a good practice instrument for soil management and protection caused by weakening the EIA outputs impact
Considering the influence to environment of products is the potential for enhancing the effectiveness of the instrument.	There could be problems in effectiveness caused by different interests of competent authorities while making decision based on EIA outputs.
For compaction, sealing, pollution, loss of organic matter and even erosion types of impact the instrument could be a good practice instrument.	In case the instrument is not applied properly than environmental harm could happen to soil.
By application of this instrument there can be achieved general soil and environment protection knowledge.	

Conclusions

The instrument isn't the best practice instrument because it includes soil protection only by a side effect

Recommendations for the further development

– accepting the EIA outputs as mandatory acts
– Considering the influence to environment of products.

Assessment: instrument with development potential, because soil protection is already included and can be used as data entry for EIA process

5.2 Environmental law

Zákon č. 17/92 sb. O životním prostředí, ve znění pozdějších předpisů

Short description of the instrument

determination of basic concepts, definition of the soil as the component of environment

Objectives:

- determination of basic conceptions
- setting of environmental protection principles
- setting of corporations and individuals duties in environmental protection and amelioration

Appropriate authorities for environment of state administration applies this Instrument:

- in case of harm to the environment caused by corporations or individuals action
- in case that corporations or individuals doesn't take necessary actions for reparation
- in case that corporations or individuals doesn't draw appropriate authorities attention to environmental harm threat or environmental harm itself.

This instrument is applied on daily basis.

Status	Type of intervention
LEX nat.	Goal to protect soil

Execution

To result in sustainable soil protection this instrument is possible to be applied independently.

Appropriate authorities for environment of state administration are inflicting fines or another actions according to this instrument

Strengths	Weaknesses
This instrument covers environment protection in general and draws on sustainable land development principles. Sealing, pollution, loss of organic matter and erosion aspects of soil protection are covered. For pollution type of impact it does function well. The instrument determines directly pollution type of impact and prescribes actions to deal with it.	The general approach to environmental protection coverage brings less individual and detailed determinations and solutions. Compaction aspect of soil protection is not covered. For loss of organic matter types of impact the instrument is less suitable. It doesn't determine it directly.
Opportunities	**Threats**
There is potential of this instrument to become a good practice instrument for soil management and protection by detailed determining of basic conceptions along with their quantification and limitation. There is potential for enhancing the effectiveness of the instrument by strengthening competences of Ministry of environment authorities instead of Ministry of local development or Ministry of industry and commerce authorities. Then for compaction, sealing, pollution, loss of organic matter and even erosion types of impact the instrument could be a good practice instrument. By application of this instrument there can be achieved general soil and environment protection with all necessary measures	There are possible threats in developing this instrument into a good practice instrument for soil management and protection caused by possible wrong interpretation or definition or setting inadequate limits. There could be problems in effectiveness caused by different interests of competent authorities. In case the instrument is not applied properly than environmental harm could happen to soil.

Conclusions

Recommendations for the further development

- Detailed determining of basic conceptions along with their quantification and limitation.
- Strengthening competences of Ministry of environment authorities instead of Ministry of local development or Ministry of industry and commerce authorities.

Assessment: instrument with development potential, because recommendations are real.

5.3 Act No. 334/1992 on protection of agricultural land resources

334/1992 sb. o ochraně zemědělského půdního fondu
as emended by the following regulations

Short description of the instrument

Pursuing agriculture land management, agriculture soil lost regulation, soil removal taxes, specification of removal, activity of soil protection service. Top soil removal, reuse of top soil, recultivation processes. Agricultural soil consumption (permanent or temporary). Payment for agricultural soil consumption. Soil protection at non-agriculture land use, proposal of steps at agricultural soil consumption.

The objectives of this instrument
- Determining conditions for agriculture soil funds protection
- Determining conditions Enhancing the soil quality
- Determining conditions for rational use of soil

Appropriate authorities for environment of state administration applies this Instrument:
- Local authorities
- Area authorities
- National parks mending
- Ministry of Environment

The instrument is being applied on regular basis

Status

LEX nat.

Type of intervention

Goal to protect soil
land use regulation/zoning
permission
tax regulation
use of brownfields

Execution

To result in sustainable soil protection this instrument is possible to be applied independently.

Appropriate authorities for environment of state administration are inflicting fines, approving certain actions and is considering conditions for approval or is taking another actions according to the instrument

Strengths

Appropriate authorities are approving the soil extraction from agricultural soil fund only in most serious cases. The extraction is being paid by the requesting side to the environmental fund.

The instrument covers conserving the overburden and plough – lands

Sealing, pollution loss of organic matter and erosion aspects of soil protection are covered.

For compaction, sealing, pollution and loss of organic matter types of impact it does function well. All of these impacts are covered.

Weaknesses

Only agriculture soil is included in the protection in terms of this instrument

Since 1992 the fine value has not been updated according to the market situation and development

Compaction aspect of soil protection is not covered.

The instrument covers too general and not precise conditions for soil extraction from agricultural soil fund.

Opportunities

There is potential of this instrument to become a good practice instrument for soil management and protection by revaluation of fines and conscriptions.

Than for compaction, sealing, pollution, loss of organic matter and even erosion types of impact the instrument could be a good practice instrument.

By application of this instrument there can be achieved general soil and environment protection with all necessary measures.

The instrument can be enhanced including all soils into the soil protection.

For compaction, sealing, pollution, loss of organic matter of impact the instrument could be a good practice instrument.

Threats

There are possible threats in developing this instrument into a good practice instrument for soil management and protection caused by possible wrong valuation of fines and conscriptions.

There could be problems in effectiveness caused by different interests of competent authorities.

In case the instrument is not applied properly than environmental harm could happen to soil.

Conclusions

The instrument is not good practise instrument. The most important problem is that only agricultural soil is being under protection, high quality soil that is not included in the agricultural soil fund is not covered. It doesn't cover soil generally as a part of environment.

Recommendations for the further development
- New valuation of fines and conscriptions
- Determining conditions for extraction of soil from soil funds

Assessment:

With the recommendations the instrument has a great potential.

6. German instruments

In Germany six instruments were identified on national level, eight instruments for the state Baden-Württemberg and one instrument for Stuttgart. Six instruments were selected for the SWOT analysis.

The selection of instruments for the SWOT analysis comprises:

1. Spatial planning and Building Legislation
2. Federal Soil Protection and Contaminated Sites Ordinance
3. Soil Protection and Contaminated Sites Act
4. Nature protection Act and Nature protection Act
5. Guideline for the assessment of soils according to their performance
6. Guideline for the environmental compartment soil in the compensation regulation

6.1 Spatial planning and Building Legislation

Raumordnungsgesetz (ROG), Spatial Planning act
Baugesetzbuch (BauGB), Building Act
Gesetz über die Umweltverträglichkeitsprüfung (UVPG), Environmental Acceptability Assessment Act

Short description of the instruments

According to all regulations concerning spatial planning, building legislation and environmental assessment the environmental compartment soil has to be considered. The main requirement is, that the usage of soil has to be sparingly, carefully and economically. Therefore, the original soil quality and the impacts on soil within the change of land use have to be identified, described and evaluated.
Applied by planning and environmental administration in every process.

Status	Type of intervention
LEX nat.	land use regulation/zoning

Execution

The implementation of the requirements in practice is executed in BOKS, in the guideline "Assessment of soils according to there performance" (Heft 31) and the guideline "The environmental compartment soil in the compensation regulation"

Strengths	Weaknesses
In all the regulations the sparingly, carefully and economically usage of soil is explicit mentioned. The regulations are binding, they have to considered by all planning authorities. In Baden-Württemberg and Stuttgart exist the above mentioned guidelines which make it possible to define these requirements.	The sparingly, carefully and economically handling of soil is an indefinite legal term. Therefore in practice the effectiveness of these requirements is low. Particularly regarding the building legislation the influence of the administration for soil protection is restricted because the municipalities have the planning authority.
Opportunities	**Threats**
Concrete definitions of the terms sparingly, carefully and economically would be helpful Implementation of binding thresholds for a sustainable soil consumption would be helpful in particular for an easier monitoring. A solution to reduce the soil consumption could be a fixed but tradable amount of soil consumption (including the aspect soil quality) comparable to the regulation concerning the CO2 emissions.	The implementation of thresholds for land/soil consumption could cause problems of acceptance because the planning authority of the municipalities would be restricted in addition to protected areas e.g. for nature, groundwater, FFH. The possibility to trade with area/soil could be a thread for high quality soils because rich communities with a high extend of high quality soil, would be able to buy a lot of "consumption permissions".

Conclusions

The regulations are good practice instruments to prevent sealing, urban sprawl but only if there are guidelines implemented in the planning process which allows assessment of soils and their functions and also the valuation of functional losses by encroachments.

6.2 Federal Soil Protection and Contaminated Sites Ordinance

Bundes-Bodenschutzgesetz (BBodSchG), Federal Soil Protection Act and Bundes-Bodenschutz-Verordnung (BBodSchV),

Short description of the instrument

the main objectives of this act are the protection of the quality of soils and the prevention/remediation of threats caused by contaminated soil.

It is applied by environmental administration, in most cases to evaluate and remediate contaminated sites.

It is applied in every case of harmful soil changes and the remediation of polluted sites by the soil protection administration.

Status	Type of intervention
LEX nat.	Goal to protect soil impact assessment concerning contamination monitoring

Execution

The execution of the BBodSchG requires the application of the ordinance BBodSchV and several guidelines mainly to evaluate contaminated sites.

Strengths	Weaknesses
The functions of soils are defined. The objective is the protection of particularly the natural functions in case of encroachments as far as possible. The main strength of the BBodSchG/V is to handle all harmful soil changes, especially pollution. It defines the responsible person for soil impacts. It's ordinance delivers specific pollutant-thresholds (trigger, action and precaution values) for different land use, for groundwater protection and for prevention	There are no concrete regulations to prevent sealing. The definition of the soil functions also contains the functions for settlement, traffic, disposal of waste and other economic utilisation. The priority is on the natural functions of soil, but there is room for interpretation. In the framework of good agricultural practice (§ 17) precaution is often not possible. Hazards can be caused despite good practice in agriculture, but then it's not possible to use other regulations of the Act. In the ordinance are some phrase with "should" instead of "have to", in other cases there is a lack of details/definitions e.g. for "significantly" or "extensive"
Opportunities	**Threats**
An opportunity of the Act and ordinance would be the integration of precaution particularly regarding sealing, soil consumption and compaction. In this context it would be necessary to implement regulations for the assessment of soil functions to identify and protect high quality soils within planning processes.	Threats if the instrument is not applied (properly): Reuse of contaminated materials on soil or reuse of contaminated soil Insufficient/no remediation of soil and groundwater Threats for human health caused by contaminated soil.

Conclusions

It is a best instrument to handle contaminations of soil. The issue precaution should be improved. Especially the protection of high quality soils, reduction of compaction and erosion.

More account for prevention of urban sprawl and sealing within planning/building processes.

6.3 Soil Protection and Contaminated Sites Act of the Federal Land of Baden-Württemberg

Gesetz zur Ausführung des Bundes-Bodenschutzgesetzes [LBodSchAG]

Short description of the instrument

The soil protection administration of the federal Land Baden-Württemberg is in charge to survey, that the regulations of the "Bundes-Bodenschutzgesetz" are fulfilled. Additional they have to make sure to deal with soil and surface economically, carefully and sparingly.

It is applied by environmental (soil protection) administration of the federal land Baden-Württemberg

Status	Type of intervention
LEX reg.	Goal to protect soil

Execution

One part of the execution is the environmental information system of the federal land Baden-Württemberg (UIS) with data to contaminated sites and soil properties.

Strengths	Weaknesses
It is possible to banish areas with extensive polluted soils or small areas with soils worthy of protection. §1 of the Act makes the soil protection administration to "lawyers" in all approval procedures for the economically, carefully and sparingly handling with soil. The administration for soil protection and contaminated sites must be participated in cases where significant impairments on the natural soil functions and the archive function or the remediation of contaminated sites are expected. It is regulated that data particular about contaminated sites should be captured by the administration and give information to the communities and land owner.	Specific requirements for the reduction of the usage of land/soil, reuse of low quality soils, usage of lacks between buildings do not apply to planning processes within the building legislation (BauGB). The agreement of the administration needs to be achieve by the initiators of projects, but if that doesn't work, it's not necessarily an impediment for a project. In practice the participation of the soil protection administration is not self-evident.
Opportunities	**Threats**
The requirements of the soil protection administration should be more effective and binding. The duties in §2 should also be binding for projects within the BauGB/urban land use planning	The increasing binding of the duties within soil protection could cause problems of acceptance because the planning authority of the municipalities could be restricted.

Conclusions

The instrument is a good practice instrument, it includes effective duties for soil protection but they are too little binding

By changing some terms or implement a concrete ordinance there could be effect more binding

6.4 Nature protection Act and Nature protection Act of the Federal Land Baden-Württemberg

Gesetz über Naturschutz und Landschaftspflege (FRG)
Gesetz zum Schutz der Natur, zur Pflege der Landschaft und über die Erholungsvorsorge in der freien Landschaft (Baden-Württemberg) [NatschG]

Short description of the instruments

Goal of the nature legislation is to safeguard the performance and the functional capability of the ecosystem as well as the sustainable usage of natural assets. It requires to use the natural assets economically and carefully. It is explicit mentioned, that soils has to be preserved, protected and used in a manner that they can fulfil their functions in the ecosystem. Important for soil protection is the compensation regulation implemented in the nature protection acts. According to the regulation, an initiator of interventions is committed to compensate encroachments by compensatory measures. Additional, in Baden-Württemberg, the initiator is committed to a compensation payment if there is no possibility to compensate by measures.

Concerning soil and the soil protection administration it is applied in planning processes.

Status	Type of intervention
LEX nat. LEX reg.	impact assessment

Execution

An effective execution needs the application of instruments for the assessment of soil functions and the assessment of compensatory measures. In Baden-Württemberg exists two guidelines: “Assessment of soils according to their performance” and “The environmental medium soil in the compensation regulation” described below.

Strengths	Weaknesses
In particularly concerning the compensation regulation, the acts allows the request of a valuation of soil functions, the evaluation of soil losses by encroachments and the description and valuation of compensatory measures in combination with the two guidelines mentioned above. Furthermore, in combination with the compensation payment ordinance of Baden-Württemberg it is possible to calculate a compensation payment for functional soil losses.	In Baden Württemberg soil protection and nature protection are located in two different administrations. Therefore its sometimes difficult for the soil protection administration to apply the regulations located in the nature protection act and to implement and apply the guidelines, which were developed by the soil protection administration. Also the nature conservationists have often different functional targets because their main issues are flora and fauna and not the natural functions of soils. The compensation regulation particularly the compensation payment is not binding for projects within the building legislation. Although the compensation regulation in the building legislation is similar to the nature protection legisl., the municipalities as owner of the planning authority, can not be committed, to apply certain guidelines.
Opportunities	**Threats**
The difficulties in the application, caused by the location of the different regulations in different acts (nature, building, soil, zoning) might be resolved by the development of a comprehensive environmental act. This was provided but till now it failed in the FRG.	As already seen in the developing process of a comprehensive environmental legislation, the acceptance by different groups is a problem. It is not sure, that the important aspect of precaution (particularly soil consumption) would be really improved in a comprehensive act.

Conclusions

The regulations concerning the soil are good instruments but without guidelines as established in Baden-Württemberg the effectiveness is low.

6.5 Guideline of the ministry of environment Baden-Württemberg (1995): Assessment of soils according to their performance

Guideline of the ministry of environment Baden-Württemberg (1995):
Bewertung von Böden nach ihrer Leistungsfähigkeit
Leitfaden für Planungen und Gestattungsverfahren

Short description of the instrument

The guideline provides methods by which soil functions have to be assessed. The guideline was published in 1995 and is currently being revised. 5 soil functions are considered:
- "Natural soil fertility", "habitat for natural vegetation", "regulation of water balancing", "filter and buffer for pollutants" and "archive of natural and cultural history."
The evaluation is done basically by a 5-step scale with "0" for sealed soils and up to "4" for soils with a very high perfomance. The exceptions are the functions of "habitat for natural vegetation" and "archives of the Natural and Cultural History". "Habitat for natural vegetation" will only be evaluated and mapped, if soils occur with high or very high (3 or 4) performance. "Archives of the Natural and Cultural History" are not assessed within the 5 step-scale but only evaluated by verbal arguments.

As in planning processes a simple evaluation of individual environmental compartments is necessary, the average value of the functions "natural soil fertility", "filter and buffer for pollutants" and "regulation of water balancing" could be taken. The "habitat for natural vegetation" must be documented separately, so that the result will not be falsified. The evaluation of the functions can be done in two ways: On the basis of a soil map or the soil assessment (rating taxation). In Baden-Württemberg both are available as digital assessment maps.
The instrument is used in almost every planning process. The main users are the planning offices of municipalities or other initiators of projects (e.g. road construction).

Status	Type of intervention
Reg. guideline	Goal to protect soil land use regulation/zoning

Execution

The application of the guideline fulfils the requirements concerning evaluation and assessment of soils according to the building and nature legislation. It is the base to apply the guideline "The environmental compartment soil in the compensation regulation"

Strengths	Weaknesses
By the clear and comprehensive assessment of the performance, high-quality soils can be identified and taken into account in planning processes. This makes it possible to steer soil consumption on less valuable soils, if planning alternatives are available. The soil valuation is a prerequisite for quantitative assessment of the impact of encroachments and therefore a prerequisite for the determination of compensation requirement. This is determined in the guideline "The environmental compartment soil in the compensation regulation".	The guideline has no legal binding. The valuation of soil functions leads not to a certain protection status (protected area), although the soil quality might be very high.
Opportunities	**Threats**
In combination with the already mentioned improvement of the building and/or soil protection legislation it could be possible to define thresholds for soil quality leading to a protection status. Integration of this methods in the soil protection act/ordinance e.g. as a DIN.	The implementation of thresholds for land/soil consumption could cause problems of acceptance because the planning authority of the municipalities would be restricted in addition to protected areas e.g. for nature, groundwater, FFH.

Conclusions

Best practice instrument (s. strengths and opportunities)

6.6 Guideline of the ministry of environment Baden-Württemberg (2006): The environmental compartment soil in the compensation regulation

Das Schutzgut Boden in der naturschutzrechtlichen Eingriffsregelung

Short description of the instrument

The guideline enables the quantitative determination of functional soil losses on the basis of soil evaluation (see above). Thereby the impacts of encroachments, e.g. sealing, excavation or compaction caused by construction damage, and the compensation requirements could be determined. Thereby the soil quality as well as the size of the area are considered. The guideline contains suggestions for compensation measures and the calculation of the compensation effect. The instrument is often applied but not in all planning processes.

The main users are the planning offices of municipalities or other initiators of projects (not according to the building legislation).

Status	Type of intervention
Reg. guideline	impact assessment

Execution

With the guideline the requirements of the compensation regulations in the building and nature legislation can be fulfilled. The base to apply this guideline is the guideline "Assessment of soils according to there performance".

Strengths	Weaknesses
The method allows the clear documentation of the losses caused by encroachments in soils. The application of the guideline also makes clear that a compensation of soil losses is hardly possible and in most cases a deficit remains. It makes clear that the consumption of soil is largely irreversible. Because of the positive correlation of the soil quality and the remaining deficit, the application of the guideline has a steering effect.	The guideline has no legal binding up to now. Deficits may be compensated by relatively small payments. In planning processes according to the building legislation, deficits can be ignored within the weighing process.
Opportunities	**Threats**
Integration of this methods in the soil protection act/ordinance or the building or nature protection legislation e.g. as a DIN.	The method shows that there are almost no possibilities for compensation. This is a problem of acceptance for the policy (municipality) because the other environmental compartments are commonly compensated by measures. Therefore deficits are a new experience because before the implementation of the guideline, soil usually wasn't considered in the compensation regulations.

Conclusions

Good practice instrument, because the execution shows clearly the impacts of encroachments in soils.

By the application of the guideline it is possible to make the importance and the value of soils more obvious in comparison with the other medias like flora and fauna.

7. Italian instruments

In Italy five instruments were identified on national level, four instruments on regional level (Lombardia), two instruments for Torino, two instruments for the region Piemonte, five instruments for Milano and one regional guideline (Alpine Convention). Seven instruments were selected for the SWOT analysis.

The selection of instruments for the SWOT analysis comprises:

1. Law in environmental matter
2. Additional rules in environmental matter
3. Guidelines for provincial assessment on compatibility of municipal planning tools with the Provincial Land Coordination Plan
4. Implementation norms – present, Plan of rules – forecast for the Master Plan of Milan
5. Building Regulation of the Municipality of Milan
6. Rehabilitation of polluted sites in the Piemonte region
7. Alpine Convention – Protocol on Soil Conservation

7.1 Law in environmental matter

Decreto Legislativo 3 aprile 2006, n. 152 "Norme in materia ambientale"
pubblicato nella Gazzetta Ufficiale n. 88 del 14 aprile 2006 – Supplemento Ordinario n. 96

Short description of the instrument

It is the major law on Environmental legislation in Italy, but gives an incorrect definition of soil (for soil is intended: land, soil, subsoil, build-up areas and infrastructures). It covers many aspects of the environment, in particular, it defines when a soil can be considered contaminated, pollutants thresholds depending on different urban land-uses, procedures for risk assessment of contaminated soils. It regulates EIA/SEA processes, prescribes risk assessment, regulates soil and water pollution and remediation.Planners, regulators, consultants, local authorities apply the instrument very often.

It is mandatory to apply it whenever soil contamination is considered

The Decree 4/2008 quoted below it is in fact an updating of Law 152/06 about excavated soils.

Status

LEX nat.

Type of intervention

Goal to protect soil

impact assessment

Execution

The “Norme in materia ambientale" has a strong impact on soil management as a consequence of risk assessment analyses. For instance, if risk from surface soil contamination is recognised as a potential threat for citizens, that area will never become a park and has to be sealed or paved (e.g. parking/industrial area) unless it is polluted. It is executed whenever contamination is observed or potentially present in soils.

Originally this Law moved shifted competence about land reclamation from the Municipal level to the Regional one. In fact, this made it nearly impossible for the public bodies to control effectively land use due to excess of administrative burden on the Regional offices. Ssome Italian Regions, including Lombardy, issued specific Regional Law that appointed again Municipalities to take care of reclamation procedures. If a small municipality has no sufficient means or skills to control effectively a reclamation process, in principle Provincial technicians contribute. Usually major towns have their technical offices looking after reclamation procedures.

Strengths

Collects in just one tool norms and regulations that were scattered in different legislative instruments and tries to make them coherent to each other.

It clearly defines when a soil has to be considered as contaminated, who are the actors involved in its management/remediation and the procedures for risk assessment of contaminants

It makes compulsory to the responsible of the pollution to take charge of the reclamation process

It covers widely the aspects of soil pollution but mainly pollution, for it leaves care of hydro-geological protection to specific plans on basin-scale and influences only indirectly compaction or erosion.

By ruling all aspects dealing to contaminated soil investigation, management and remediation it contributes to soil protection.

As written above, it works well for pollution because it identifies specific thresholds that make reclamation process automatic

It states also clear limits for water quality, thus integrating thresholds set for underground water whenever any question arises about which conformity point has to be considered in Risk Assessment procedures.

Soil pollution, soil in general when involved in environmental impact analysis is covered by the law. It functions especially well for soil pollution, as it is deeply covered in all its aspects (contaminant thresholds, investigation methods, risk assessment. It clearly defines who is the subject responsible among local authorities (Municipalities, Provinces, Region, Ministry) for all the different aspects concerning soil contamination.

Weaknesses

It is sometime contradictory when dealing with polluted areas, it creates confusion between a simple “pollution threshold” and a Risk Assessment based approach.

It doesn’t cover in a satisfying other issues such as erosion or ground sealing, leaving only to local regulation the task to norm those aspects.

It needed several updates (still in progress) on regulation of excavated soils: how to treat them, which administrative procedures should be followed when a building permission is asked on a land with reclamation process ongoing etc.

It is an extremely long document, that form 2006 has been already modified twice.

Only soil pollution is considered, all other aspects are not covered. Thus it is less suitable for loss of organic matter and erosion.

Only soils in urban/residential or industrial areas are covered, agricultural areas are not covered by the document.

Opportunities

It still needs to be fixed in some parts, but once the flaws are resolved it can become a unique and complete legislative tool to ensure safe management of polluted soils.

There is potential for enhancing the effectiveness of the instrument.

Threats

The only problem with acceptance is public awareness of the pressure exerted by urban sprawl on soil ecosystems. If the wide public doesn’t realize this problem, it will perceive the instrument just as a useless constraint to the building sector, that is always perceived as one of the mayor puling forces for national economy and welfare.

Opportunities	Threats
Once integrated this law could effectively take care of all soil related threats. It should produce a specific document on soils (and not covering all environmental compartments), which, besides, contamination, specifically assess soil erosion, compaction, loss of organic matter Proper integration of all types of impact (compaction, sealing, pollution, loss of organic matter, erosion) in its missing parts. A good and shared regulation on sampling, analyses, management and practices for soils could be achieved for soil protection by application of this instrument.	If the instrument is not applied properly it could slow down urban transformation processes, and thus then be abolished leaving soil with no protection at all in the future. To cover soils in all their aspects (pollution, erosion, sealing etc.) and in all their potential uses (agricultural, residential, industrial) it is extremely difficult and there is the risk of missing some crucial aspects in their management if everything has to be put in a single document

Conclusions

The instrument is the main tool to protect soil quality.

Recommendations for the further development/appliance are to fix juridical flaws that sometimes make it inapplicable.

For the further development/appliance it should cover other aspects regarding soil protection rather than contamination

It clearly defines who are the actors involved in soil protection, which are the instruments to be adopted (sampling criteria, risk assessment procedures), it establishes thresholds for contaminants as a function of land use. It does not give criteria for parameters other than contaminants (ex. Organic matter, particle size distribution, etc,) that could be easily integrated in terms of range values that have to be ensured in function of the type of destination of the soils (e.g. parks, agricultural production, built-up areas).

It is a good practice instrument and also an instrument with development potential, because it establishes the basic principles of environmental protection, also in the field of soils and land use. It also establishes the framework and the reference strategy for regional or local laws and regulations that better detail intervention on soil management.

7.2 Additional rules in environmental matter (modifications to the Dlgs n. 152 03/04/2006)

Decreto Legislativo 16 gennaio 2008, n.4 "Ulteriori disposizioni correttive ed integrative del decreto legislativo 3 aprile 2006, n. 152, recante norme in materia ambientale".(GU n. 24 del 29-1-2008- Suppl. Ordinario n.24)

Short description of the instrument

It rules soils coming from excavation/digging operations. In particular, each time the soil comes from contaminated sites or it shows concentrations of contaminants above legislative limits it has to be considered as a waste. If soil is not contaminated it is considered as by-product and can be re-used or sold as it is. In Italy wastes follow specific regulations and have different contaminants thresholds than soils. As an example, a contaminated excavated soil will be identified by a CER (European Waste Catalogue) code, which typically is 191301 or 191302

The objective of the law is to give a clear description on how to treat the materials that comes from soil excavation procedures. The instrument it is always applied whenever soil is excavated. If soil is not contaminated it is catalogued with a CER code 170504.

Status	Type of intervention
LEX nat.	Goal to protect soil

Execution

The instrument is applied together with the national law 152/06, who defines the concept of soil pollution and rules the treatment of contaminated soil.

Strengths	Weaknesses
The law indirectly protects soil by ruling its fate each time is has to be excavated It focuses on soil pollution, as no other parameters except contaminants are considered to classify the quality of soils	No major weaknesses It only considers pollutants Thus, soil compaction, soil sealing, loss of organic matter, erosion are not covered. The instrument is less suitable for soil erosion, which is very difficult to define in terms of physico-chemical parameters to be investigated
Opportunities	**Threats**
Include more parameters to define the fate of soil whenever it is excavated.	Soil could be excavated , removed and replaced without any control on its quality and its fate.

Conclusions

The Instrument is a good practice instrument only for soil excavation processes with development potential.

In function of the final destination of the excavated soil it could consider some parameters other than contaminants (e.g. particle size distribution, pH, organic matter etc.)

7.3 Guidelines for provincial assessment on compatibility of municipal planning tools with the Provincial Land Coordination Plan in the transitory period until upgrading of PLCP to Regional Law 12/05

Indicazioni per l'attività istruttoria provinciale in ordine alla valutazione di compatibilità degli strumenti urbanistici comunali con il PTCP nel periodo transitorio sino all'adeguamento del PTCP vigente alla LR 12/05

Short description of the instrument

This is an internal guideline for technicians of the Provincial Administration helping them to evaluate municipal master plans and to check conformity to the Provincial Land Coordination Plan. It is a temporary instrument and shall be replaced once the Provincial Administration has updated the PLCP in conformity with Regional Law 12/2005.

Status	Type of intervention
Reg. guideline – in fact it is at a lower level than Regional, i.e. "provincial" (there are 20 provinces in Lombardy Region)	land use regulation/zoning

Execution

As introduced above, this instrument itself completes the already existing PLCP and compensates lack of conformity to the regional planning level. It is obviously to be applied in combination with other regional and national laws, for it just take into consideration land patterns and not quality measures or more complex land protection issues.

It is not a rigid and always applied instrument, for it has very limited jurisdiction.

Strengths	Weaknesses
It is the first case where aspects such as – reuse of built soil, – permeability of urban soil – availability of green areas with trees – fragmentation of productive plants – accessibility to railway or underground stations – Availability of pedestrian or cycle lanes – environmental connectivity – are explicitly considered in a planning tool. This instrument should be considered in combination with PLCP and municipal master plans to evaluate its effectiveness. It provides reference and objective values for all the aspects listed above, this gives municipalities clear indications on their development r conversion strategies. This approaches targets mainly issues of compaction, sealing, lost of organic matter and erosion), but its effectiveness is limited by the small power of the Province and by the temporary nature of the instrument.	Weaknesses, as stated above, reside mostly in the limited power of the Provincial government, and on the limited extension of its domain. Another weakness is due to the temporary nature of the tool, there is hence still the risk that it will not be embedded in future versions of the PLCP. A disadvantage reside in the fact that a simple numerical assessment can lose sight of land use patterns, so it has always to be accompanied also by a geometrical interpretation This instrument doesn't take charge of soil pollution, for it is a pure land pattern, not soil quality, evaluation tool.
Opportunities	**Threats**
If these guidelines become integral part of the updated PLCP and demonstrate their advantages in practical application, they can be adopted by other provinces in the Lombardy Region or – potentially – also by other Regions with similar land use and shape of terrains. The effectiveness of the instrument can be enhanced, as written above, embedding it in day-by-day land planning practice. As it is currently, effectiveness of this instrument can become more effective on compaction, sealing, loss of organic matter, erosion, while it is unlikely that it will affect strongly soil quality. The widespread application of this instrument can bring to a neater and tidier land texture (limitation of urban-sprawling) and less soil-consumptive	Threats reside in the fact that this, as it already happened to the old Municipal Master Plan for Milano and other cities, can become a cause of delay in the evaluation process of transformation plans. Hence it can be disregarded and abandoned after few years, hence leaving again the soil with no protection Problem in effectiveness arise from limited duration of the tool itself and for possible not inclusion of the same principles in next PLCP. As long as citizens don't realize the value of near-nature environment or agricultural soil they can perceive the instrument just as a constraint to their freedom to build. If the instrument is not applied, or not applied properly, the urban sprawl is going to continue and to destroy all near-nature soil left with appreciable dimensions.

Conclusions

The instrument a best/good practice instrument, for it introduces innovative elements in a legislation that still refers only to physio-chemical intensive qualities instead that to topological and comprehensive characteristics.

Recommendations for the further development/appliance are: test rules contained in the instrument, then – if effective-embed them into the updated version of the PLCP, in case with further indicators or with tighter target and reference values.

Assessment: best practice instrument because of the above mentioned reasons.

7.4 Implementation norms – present, Plan of rules – forecast for the Master Plan of Milan

Norme di Attuazione, Piano delle Norme
In the same analysis are reported two different documents because the Planning framework itself is changing: the present Master Plan, written in the 80'es, uses stringent implementation norms indicating percentages of surface and volumes applied rigidly and unable to adapt to local contexts, and is going to be replaced in next few months by the "Plan for Land Governance", that uses instead a so-called "Plan of rules". So Strengths and Weaknesses refer to the first, while Opportunities and Threats to the second.

Short description of the instrument

Objective of this instrument is to complement maps and diagrams in the Master Plan/Land Governance Plan, and give "verbal" indications on practical implementation of planning address.

It is applied by municipal technicians to conceive, adjust or address public and private land development initiatives

It is applied on a daily basis, the bigger the town, the more often it is applied.

Status

It can be considered a sort of regional guideline, even if it's in fact a mandatory regulation.

Type of intervention

land use regulation/zoning

Execution

It is applied together with tables and maps identifying geometry of zones where the norms are valid. The actual norms give some address about prevention on soil sealing only when applied with the municipal building regulations, else they're not effective.

Strengths

Strengths are represented by the mandatory range of values that must be respected, for instance, by the surfacing ratio (ratio of terrain surfaces covered by the buildings and total terrain), that together with building regulations bring to leave some terrain free of sealing

Present norms affect only sealing, and they work just partially (they were conceived in the 70's, long before any consideration of "sustainability")

It preserves rural environment, in terms of farms now embedded in the urban fabric, and preserves green and agricultural terrain.

Weaknesses

As quoted above, main weaknesses descend from the lack of precise indication on soil properties, so it's up to sensitivity of the municipal technician to apply the norm together with the building regulations.

As already explained, the norm doesn't consider explicitly none of the soil protection issues quoted, except when applied together with municipal building regulations.

Opportunities

In this section we consider just the Plan of rules, because it's the instrument that will be applied in the near future instead of the present implementation norms:

The Plan of rules, actually in development, can embed different environmental parameters. It can take into consideration several aspects currently neglected. It should be possible to suggest technicians in charge of defining new rules to modify them.

It could maybe be possible to add parameters relative to compaction, sealing, pollution, loss of organic matter, erosion in the norms; it's actually a bit difficult because of the "secrecy" put by politicians and on technicians in charge for the subject

Threats

The threats in the Plan of Rules are in the nature itself of the Land Governance Plan: methodological and procedural with no real effect, so that with the right arguments any plan can be justified.

There could be problems in effectiveness, but we still don't know exactly how that rules will work.

And problems of acceptance can arise Just in the moment everybody will understand what that rules are exactly!

It is not possible yet to define what is a proper or improper application of the instrument

Conclusions

The instrument could become for sure a good practice instrument... let's see what we can do to influence its definition; recommendations are about the new Land Governance Plan (and subsequent Plan of rules) to consider both intensive and extensive properties of terrains.

The present instrument (implementation norms) has given precise indications on how to realize addresses of the Master Plan; its flaws reside in the rigidity with which it applies threshold with no care about the context. At the present time it's impossible to assess the new Plan of rules for it's not yet public.

Present norms are not adequate for soil protection

Future plan of rules can become a good practice instrument

It is an instrument with development potential, because it can be updated.

7.5 Building Regulation of the Municipality of Milan

Regolamento Edilizio del Comune di Milano

Short description of the instrument

Objectives of the instrument is to give precise rules for the realization in detail of buildings. It is at a more detailed level compared to Implementation norms, and complete them with reference on many issues. It is updated from time to time, present edition was approved in 1999 but there are at least two edition of proposed updates awaiting for approval; in the present analysis we will take those modification in consideration as already approved.

The instrument is applied continuously in any building work, from the small interventions to the complex transformation plans.

It is applied by project designers and conformity to it is controlled by municipality technicians and even from municipal police.

Status

It is a mandatory local regulation

Type of intervention

In the updated version it also includes objectives of soil protection.

It is the ultimate instrument to define which intervention can be permitted and which in not acceptable.

Now they started inserting articles into it about energy efficiency, so it can also rule incentives and taxes, but not on land use (at least at the present time)

Execution

The framework of validity of this instrument is anyway defined by the Master Plan and the Implementation Norms (until the adoption of the Land Governance Plan and the Plan of Rules).

It is applied by designers, which must subject their instruments to the competent offices of the Municipality. The conformity of the realization should be guaranteed also by public officers (as municipal police officers competent for every zone of the city)

Strengths

The instrument has immediate effect on all building works in the municipality. Together with the Implementation notes it gives a coherent framework to developers or even private citizens.

It explicitly comprehends among its objectives preservation of permeability of soils and chemical and physical quality.

It identifies hazardous activities (such as manufacturers who use dangerous materials) and imposes environmental surveys when one of that activities end.

Weaknesses

At the present time this instrument just considers chemical and physical quality of terrains, together with need of maintaining and adequate permeability for water.

It doesn't really consider local ecosystems; at the present time it doesn't even consider soil compaction, loss of organic matter or erosion.

it is also little suitable for pollution, because it still doesn't make excavation plans mandatory.

Opportunities

The ongoing updating process for the instrument will bring it to have a mandatory rigid separation between activities related to soil reclamation and activities related to building execution. A mandatory plan for the excavation will be subjected to the regional Environmental Protection Agency prior to authorization of any transformation plan on former industrial sites, in order to avoid illegal dumping or re-use of hazardous excavation material.

The updated version will also comprehend definition of ecological sustainability and biocompatibility as inspiring principles. It will also introduce concepts of preservation of "biological compatibility" of development works with other living beings.

In principle the instrument can become a best practice instrument for all soil-related aspects, being soil one of the ecosystems affected by building activities.

Threats

Only threats reside in the lack of awareness of citizens and developers about need of preserving ecosystems, so new constraints can be interpreted as impositions and generate protests or even pressure by builders lobbies (as it already happened on proposal of regional laws); so awareness campaign become necessary to gain acceptance by the wider public and political backing.

There should be no problems in effectiveness, for the tool is – under the present law – immediately effective and compulsory.

As many similar tools, the improper application of such instruments produce paralysis in the transformation of the city, and dangerous consequences in the local economy end hence in the political support to the general strategy.

Conclusions

the instrument can be a best practice tool, as it already happens in other Italian municipalities.

It is the main instrument at a metropolitan level where ecological issues should be embedded with an immediate and tangible outcome, so a close attention should be kept on it.

Assessment: best practice instrument with development potential, because of the above mentioned reasons.

7.6 Rehabilitation of Polluted Sites in the Piemonte region

Legge regionale 7 aprile 2000, n. 42. Bonifica e ripristino ambientale dei siti inquinati (articolo 17 del decreto legislativo 5 febbraio 1997, n. 22, da ultimo modificato dalla legge 9 dicembre 1998, n. 426). Approvazione del Piano regionale di bonifica delle aree inquinate. Abrogazione della legge regionale 28 agosto 1995, n. 71. (B.U. 12 aprile 2000, suppl al n.15)

Short description of the instrument

The objective is to regulate soil contamination in Piemonte Region.
The law has been substituted by the national law 152/06 (see previous instrument). However, it is still in use as it also covers agricultural soils
The instrument is applied rarely.

Status	Type of intervention
LEX reg.	Goal to protect soil by contamination

Execution

In theory this instrument is not together with others, but most of its parts are now not in use as covered by National Legislation
The rehabilitation of polluted sites is cited and used only at Regional scale, when focusing problems of contamination in agricultural soils

Strengths	Weaknesses
The rehabilitation of polluted sites covers agricultural soils, it introduces the concept of "bioavailability" to plants of contaminants. It also gives pH and EC classes for soils It regulates soil contamination (even if only at regional scale) and some general chemical soil properties in agricultural areas in agricultural areas If focuses on soil pollution	The rehabilitation of polluted sites is a regional law, and has been mostly substituted by the national law 152/06 Even if it refers to all agricultural soils, only contaminants, pH and EC are considered as parameters. No consideration on texture or organic matter are given Compaction, sealing, loss of organic matter and erosion are not covered Furthermore it is less suitable for soil erosion, as it is probably the most difficult topic to be ruled. You cannot easily provide "thresholds" for soil erosion.
Opportunities	**Threats**
It should be a national law, it should include more soil parameters (PSD, OM, etc.) The rehabilitation of polluted sites could be a good practice instrument for soil pollution, loss of organic matter.	Not all aspects of soil protection can be translated in a set of indicators/values that have to be respected. Some aspects require guidelines, not thresholds. When the instrument is not applied (properly) there are risks for the environment, especially in agricultural areas

Conclusions

The rehabilitation of polluted sites is a good practice instrument
It s recommended to focus only on agricultural areas, to transform it in a National legislation and to introduce the concept of risk assessment.
All in all it is a good practice instrument, as it introduces concepts like bioavailability to plants of contaminants and some soil chemical requirements which are important for agriculture (pH, EC). However, many aspects are still missing.

7.7 Alpine Convention – Protocol on Soil Conservation

Convenzione delle Alpi (Alpine Convention)
Protocollo di attuazione della Convenzione delle Alpi nell'ambito della Difesa del Suolo (http://www.alpconv.org)

Short description of the instrument

The Alpine convention pursues the protection of the entire pool of soil functions. The partners commit themselves to provide legislative tools to put the protection of soil into concrete form
It is a guideline which has never been really applied in the region.

Status	Type of intervention
Nat. guideline	Goal to protect soil

Execution

The Alpine Convention is applied in combination with others, as it only provides guidelines to ensure soil protection. In practical terms, soils are managed according to the previously mentioned instruments.
The Alpine Convention provides some indication to regulators, that should be also followed by legislators when a new law has to be prepared and soil is concerned.

Strengths	Weaknesses
The Alpine Convention provides guidelines, which often are missing It directly addresses soil protection, by recognising the crucial importance of soils It is a tool aiming at raising the interest and consciousness of regulators and planners towards soils Soil erosion, loss of organic matter, soil sealing are covered. The Alpine Convention functions well for soil sealing and soil erosion, which can better be regulated by guidelines	The Alpine Convention is just a guideline, planners can decide to follow it or not Soil pollution is not covered by the Alpine Convention. The Alpine Convention is less suitable for soil pollution, loss of organic matter. These two topics require in fact well defined limits and tools, not guidelines.
Opportunities	**Threats**
The Alpine Convention should be applied more frequently There is a potential for enhancing its effectiveness, if it becomes mandatory to refer to this document any time planning of soil resources are involved The Alpine Convention is a good practice instrument for soil sealing, loss of organic matter, soil erosion The Alpine Convention contributes to enhance the consciousness of the importance of soil and its functions.	No major threats can be identified. There could be problems of acceptance, as soil is typically a neglected environmental compartments by planners and regulators If the instrument is not applied (properly) there is a strong risk for soil erosion, organic matter loss and for a wrong use (or better abuse) of the soil resource in all the planning phases.

Conclusions

The Alpine Convention is a good practice instrument.
It should be transferred to all soils at national scale, and adoptable by planners.
Assessment: good practice instrument as addresses most of the topics that regard soil protection, its weakness is that is simply a convention, with pure guidelines meaning and no obligations to follow it.

8. Polish instruments

In Poland eleven instruments were identified on national level. Five instruments were selected for the SWOT analysis.

The selection of instruments for the SWOT analysis comprises:

1. The law on environmental protection
2. The law on agricultural and forest land protection
3. The decree of Ministry of Environment on soil quality standards
4. The law on environmental damages and their alleviation
5. The law on excavation wastes

8.1 The law on environmental protection

USTAWA z dnia 27 kwietnia 2001 r. Prawo ochrony środowiska

Short description of the instrument

The regulation contains definition of land protection: "preservation of its quality through sustainable management, protection of nature value, land production function, soil quality at level of certain standards or remediation of soil if the standards are not met, protection of archaeological sites.

In spatial planning a sustainable management of nature resources must be ensured through programs of balanced land use, proper waste management, transport systems, green areas management, soil and landscape value protection..."

The regulation introduced continuous national monitoring of soil quality, including measurement of various contaminants and delineation of contaminated areas. Administration of LAU-2 level is obliged to develop and update register of contaminated sites.

During construction work the investor must ensure environment protection including soil, green areas and water retention. If it is not possible to protect the environment as is, it is required to apply environment protection measures, including soil remediation, afforestation, green clusters etc.

Status	Type of intervention
LEX nat.	Goal to protect soil land use regulation/zoning monitoring

Execution

Regarding contaminated soils, it is to be applied with execution regulations – the decree of Ministry of Environment on soil quality standards which specifies threshold contents of contaminants in soil.

Strengths	Weaknesses
The regulation covers mostly pollution aspect. The strength of this regulation is that it forces delineation of contaminated areas. The instrument requires rehabilitation of polluted soil to be done by a party responsible for the damage. It does not directly contribute to protection of high quality soils but obligatory clean-up reduces the areas posing risk to ecosystem and human health. Soil pollution is precisely addressed by a set of quantitative criteria for more than 40 compounds	There are no clear thresholds for soil degradation in order to trigger decision mechanism oblige responsible party for reclamation. Unfortunately, this instruments addresses agricultural and forest soils only. Aspects which are not covered by the regulation include: compaction sealing, loss of OM, erosion. As regulation is not addressing other types of degradation than pollution its suitability is limited in scope. The weak point is a limited flow of information from real estate market on contaminated areas. Special sampling campaigns would require significant funds. Unfortunately, there is no regulation forcing soil analysis when land is sold/purchased. The regulation would also need a better execution regarding implementation of protection or compensation measures during construction work by the investor.

Opportunities	Threats
The Law can be an effective instrument protecting soil functions if it accompanied by properly working execution regulations. Extension of this regulation to urban soils would be very positive.	No specific threats resulting from this regulation can be defined if it is effectively applied.

Conclusions

It is the instrument with development potential, because it has proper principles – it requires better execution by additional regulations, like decrees: e.g. forcing flow of information on contaminated areas, more specified rules for impact assessment of new investments and more effective implementation and monitoring of compensation measures. It would be feasible to change arbitrary thresholds set as cleanup targets and introduce risk assessment methods. This would reduce the cost of reclamation work and make it more effective. Today the high cost of complete cleanup discourages investors from reuse of contaminated land.

8.2 The law on agricultural and forest land protection

USTAWA z dnia 3 lutego 1995 r. o ochronie gruntów rolnych i leśnych

Short description of the instrument

The objective of this regulation is to protect agricultural and forest lands through prevention of degradation as result of non-agricultural activities and reclamation of degraded areas.

The regulation specifies that who causes degradation of land agricultural function must recover this function on own expense. If it is not possible to indicate the person that caused degradation the remediation is paid from the Agricultural Land Protection Fund.

The Agricultural Land Protection Funds gather resources through collection of fees for taking agricultural land into other land use. The funds are used for agricultural land protection, soil remediation and improvement of land quality and productivity, erosion protection.

Transformation of agricultural land of high quality (class I-III) into other uses requires decision of Ministry of Agriculture and Rural Environment if the area of interest exceeds 0.5 hectare This legal act specifies the fees for exclusion of land from agricultural production. The fee level is dependent on soil quality – the higher quality the higher fee is settled. The collected fees are directed to the Agricultural Land Protection Fund. Since 2008 the fees for change of land use in urban zones has been abolished.

The regulation contains obligation to reuse the topsoil of the consumed agricultural land for improvement of land quality in the vicinity. This instrument refers to good quality mineral soils (classes I – IV of VI) and peat soils. If such obligation is not executed, the person excluding the land is charged for improper use of the organic soil layer. The value of the fee depends on a class of soil and is an equivalent of price of fixed amount of rye grain.

Status

LEX nat.

Type of intervention

Goal to protect soil

Compensatory fees for changing use of agricultural land into other functions

Execution

It is a separate regulation.

Regarding transformation of agricultural or forest land into other uses, decision is given by Ministry of Agriculture and Ministry of Forestry, respectively. Application for the land use change is submitted to a Ministry by local administration (LAU-2 region, so called Gmina) with an opinion by NUTS-3 administration (Voivodeship).

Strengths

The regulation refers mostly to sealing and loss of organic matter aspects of soil protection but indirectly also to retention or biodiversity functions of soil. The strength of this regulation is that it significantly limits transformation of agricultural soil into other uses. Every transformation of the area greater than 0,5 ha requires separate decision of Ministry of Agriculture. Special compensation fees are paid for changing land use.

Those who utilize agricultural land into other uses must pay fees that supply budget of the Fund for Agricultural Land Protection Fund. These are important resources effectively spent for remediation, improvement of soil quality (e.g. liming) or erosion protection.

Instruments protects against an excessive expansion of urbanization into agricultural land of high productivity.

Degraded agricultural and forest soils must be reclaimed to retrieve their functions.

The other strength is related to the record forcing re-use of topsoil in a neighbourhood of the construction works. It saves the total pool of soil organic matter in the area, which is very important for retention or biodiversity functions of the land.

The positive aspects are that the regulation protects organic soils (peats) from consumption by urbanization or other construction works.

Weaknesses

The weakness is that the regulation is limited to agricultural and forest soil and does not cover urban soils.

Since 2008 there are no fees for transformation of agricultural land within urban areas. Such transformation still requires to be certified but the budget of The Agricultural Land Protection Fund is substantially limited. Most of land use change decisions take place within urban zones.

General soil productivity is addressed explicitly and partially erosion. Sealing is dealt with indirectly as regulation protects best soils from urbanization.

None of the specific parameters of soil quality or degradation status mentioned above are addressed – instead loss of productivity is a criterion for action.

If any of these aspects of degradation occur, having impact on productivity, theoretically soil functions must be restored, however reclamation targets are not quantified.

Opportunities

After amendment regulation could specifically address degradation issues such as OM decline and erosion as well as introduce set of more specific reclamation measures. Implementation of these measures could be supported by Land Protection Fund Regulation should be amended to cover protection of other soil functions in order not to be reduced to production function. Fees paid by owners changing land use into non-agricultural functions can be utilised for financing soil reclamation projects.

Threats

Regulation does not prohibit the use of waste material for reclamation of excavation sites (mineral open mines on former agricultural land). In consequence, locally, large amounts of fly ash and sewage sludge are used as filling material. In some cases this is an uncontrolled process.

There are no specific guidelines to assist design of reclamation work ensuring best effectiveness of resources used for this purposes.

Opportunities	Threats
Efficiency of the regulation could be greatly improved if specific soil degradation assessment guidelines are developed, as well as guidelines prompting a proper design of reclamation work. Indirectly regulation can be helpful in addressing all these impacts that cause a substantial loss of productivity. Application of this regulation can help to achieve reduction of urbanization of best agricultural soils, reclamation of soils affected by degradation due to human induced factors.	Responsibility and liability for reclamation of degraded soils can be a serious issue concerning some of the owners not wiling to accept "polluter pays principle" If the regulation is not applied properly, there is a potential for soil pollution related to uncontrolled use of waste materials for reclamation work.

Conclusions

This is a good practice instrument, however requires extensive amendments such as guidelines for degradation assessment and reclamation work.

When the regulation is revised, all soil functions should be addressed by instrument not just land based production.

This instrument serves an important role in management and protection of agricultural soils, however neglects a need for protection of urban soils.

8.3 The decree of Ministry of Environment on soil quality standards

ROZPORZĄDZENIE MINISTRA ŚRODOWISKA z dnia 9 września 2002 r. w sprawie standardów jakości gleby oraz standardów jakości ziemi

Short description of the instrument

The regulation specifies conditions under which a soil is classified as contaminated. The definition of contaminated soil helps to delineate contaminated areas, which is required by The Law on Environmental Protection. Standards of soil quality are defined for different land uses: protected areas, agricultural areas, industrial areas.
The standards refer to content of contaminants in soil, including trace elements and organic contaminants. The list of potential contaminants contains over forty elements or compounds.
Soil classified as contaminated must be remediated. Soil with exceeded threshold for one element or compound is treated as contaminated, except soils with naturally high content of metals (from parent rock material).
The regulation also specifies quality criteria for earth in market and that collected during earthworks and to be re-used.
The contaminant threshold contents in earth are respective to the type of land in the location of its use.

Status	Type of intervention
LEX nat.	Goal to protect soil against pollution monitoring

Execution

It is an executive regulation for "the Law on environmental protection" regarding polluted areas.

Strengths	Weaknesses
Together with the Law on Environmental Protection regulation sets standards for decontamination targets. The regulation covers over 40 substances as potential polluting agents. Extensive scope allows precise identification of pollution. Polluted soils are not allowed for certain land use functions – e.g agriculture, urbanization. It lowers risk of pollution effects on population. Pollution is an exclusive element of regulation and other issues, such as compaction, loss of organic matter, erosion, are not addressed. The positive aspect of the regulation is differentiation of threshold contents for different land uses: protected areas, agricultural lands and industrial zones. This lets to avoid similar approach to e.g. agricultural areas with food production and industrial areas where risk for contaminant transfer to food chain can be neglected. Naturally elevated content is not treated as contaminated – this would be not justified to require the clean-up from the current land owner when metals originate from parent rock material. Furthermore metals in such soils have limited availability. The regulation does not require detailed assessments for every area to save funds – delineation of contaminated areas shall be reached in phases: making the list of potential pollutants, preliminary analysis and, if needed, detailed assessments.	The weakness of this regulation, regarding its effectiveness, is that there are limited resources for delineation of contaminated areas. The regulation does not take into account soil properties affecting contaminants bioavailability, such as pH, clay content or organic matter content. The total content of given contaminant is the only criteria for classifying soil as requiring remediation. There are no risk analysis elements. Regulation is too restrictive and requires a complete cleanup to meet thresholds regardless an acceptable risk level. Some of the thresholds (such as Cd in agricultural soils) seem to be high in particular in acid soil which may lead to excessive accumulation of Cd in the food chain The regulation requires remediation understood as cleaning the soil. However, it does not provide indication on remediation methods nor information on who is responsible for cleaning-up, especialy historically contaminated sites. The regulation does not take into account that clean-up is not possible in many cases or extremely costly. It does not allow such solutions for fast risk limitation through as metals stabilization through soil amendments – lower metals availability reduces exposure of population to contamination even if contaminants remain in the soil until an effective method for clean-up is developed. Pollution is a specific target of regulation, other threats to soil quality are not covered. Scope is limited to address pollution and therefore other threats are not relevant for this instrument.
Opportunities	**Threats**
This regulation should be turned into guideline values for risk assessment and not be an ultimate set of standards to be achieved as a result of reclamation work. It requires major revision and change of principles. It is designed to exclusively address pollution problems and other aspects of soil protection will not be considered. It gives an opportunity to delineate contaminated areas and localize risk hot spots. However it must be better executed. It will help to protect new land owners from purchasing polluted lands – it limits trade of polluted soils and earths. It will help to identify remediation targets and will help to better manage areas with elevated contaminants contents in soils, and thus, lower the risk related to exposure of urban population to contaminants.	Arbitrary and restrictive pollution thresholds limit the use of this instrument as an effective tool – it implies unjustified cost for cleanup. In many areas it would be sufficient to change land use or stabilize contaminants to minimize the risk without necessity of investing in costly cleanup projects as it is currently required. Cost/benefit ratio is very poor at the moment as a consequence of not using risk assessment approach for soil cleanup. Instrument is not widely accepted by land owners and industry as it sets excessive standards and reclamation targets. The high cost of the instrument is limiting its practical use and vast areas remain contaminated and not used for new functions. Due to this most of the investment take place on clean soils.

Conclusions

Instrument is not practical and faces major problems with implementation due to high cost of reclamation work and often very low cost/benefit ratio.

Risk assessment methods should replace arbitrary thresholds in site assessment process and for setting up reclamation targets. It would help to avoid remediation where risk is low due to low availability of contaminants or limited exposure of human population or fauna.

Instrument is not adequate and not practical as it does not take into account socio-economic aspects of sustainability. It can be damaging for development with often limited benefits from environmental perspective.

8.4 The law on environmental damages and their alleviation

USTAWA z dnia 13 kwietnia 2007 r. o zapobieganiu szkodom w środowisku i ich naprawie

Short description of the instrument

The regulation defines responsibilities for prevention of environmental damages and compensation measures if a damage took place. The company (called here – user of environment) that caused environmental risk or a damage is responsible for immediate actions in order to eliminate the risk or alleviate the damage. Cost of protection or remediation activities is carried by the company responsible for the risk/damage. The company can avoid cost of protection/alleviation treatments only if it can be demonstrated other party is responsible for the damage.

Plan for remediation activities has to be agreed with an appropriate environmental protection institution.

Those institutions may force the company that caused soil degradation or risk for such degradation to measure contaminants, soil quality parameters and monitor biodiversity and landscape diversity.

Status	Type of intervention
LEX nat.	Goal to protect soil impact assessment

Execution

The institution dealing with and making decisions on protection or remediation activities is Voivodeship governor (NUTS-3) with his Environmental Department of the region where the risk or damage took place.

Strengths	Weaknesses
The strength of this regulation is that new pollution can be dealt with by risk assessment approach. It defines responsibility for environmental risks and damages and indicates who bears costs of actions. It is important that the regulation covers pollution aspects of soil degradation for all land use type not restricting obligations to e.g. agricultural land Besides damages caused by pollution, human induced land slides and subsiding are also considered. It is difficult to define its effectiveness as history of regulation is short and limited amount of data on implementation is available.	The damages to soil considered in this regulation are limited to pollution and physical damage of soil surface. Other degradation forms are not clearly specified. The regulation and risk assessment approach is limited to new damages and it does not address historical sites – before 2007. So far no risk assessment guidelines are available to assist reclamation work. Regulation is not specific to threats other than pollution and physical damage of soil surface.
Opportunities	**Threats**
It potentially can be a good practice instrument. Effectiveness of the instrument can be enhanced by covering the historical damages as well. For now it seems to be a good practice instrument for pollution prevention and some physical damages. Addressing other aspects of soil quality would significantly improve its effectiveness as environment protection regulation.	Lack of risk assessment methods tested and verified can be a problem for implementation and acceptance by concerned public of the outputs of reclamation effort. In some cases risk can be evaluated as low but perceived as high by concerned community. Improper implementation of risk assessment in decision making process can lead to environmental damages and legal claims. If risk assessment is not conducted properly sites posing heath or ecosystem risk may be not reclaimed.

Conclusions

Potentially it can become a good instrument.

It should become more consistent and cover historical damages to soil functions as well.

Development and providing of risk assessment guidelines would increase its effectiveness.

We can assess that this is instrument with development potential providing that it will cover all the sites regardless their history and age.

8.5 The law on excavation wastes

USTAWA z dnia 10 lipca 2008 r. o odpadach wydobywczych

Short description of the instrument

The regulation contains program of waste management to minimize their negative impacts.

It regulates principles for excavation waste and clean soil management, neutralization of such wastes and procedures related to certifications.

Regarding soil protection aspects, top layer of high quality soils must be returned to the same place after cease of the excavation process or, if not technically possible, used in other place for improvement of land quality.

Permission for opening of excavation waste utilization plant must be preceded by environmental impact assessment for this object.

Status	Type of intervention
LEX nat.	Goal to protect soil protected of soil functions impact assessment

Execution

The regulation is complement to other regulations such as The Geological and mining law, The Waste law or The Law on Environmental protection.

Before starting the activity, the producer of excavation wastes is obliged to submit a program of waste management for acceptance.

Strengths	Weaknesses
The main strength of this regulation is that loss of top soil containing organic matter is avoided during excavation activities. It is widely used in all major development projects It contributes to soil protection by saving and providing top soil for reclamation works. The regulation partially addresses organic matter aspects (through protection and re-use of top layer). It does not deal with other aspects such as sealing or erosion. Indirectly it touches pollution aspects through requirement for environmentally safe waste management programs.	Recovered top soil can be piled for a long time and used elsewhere for reclamation purposes. Limited effectiveness of the instrument is related to the fact that there is no specific regulations regarding handling of topsoil its reuse, storage etc. To some extent the regulation helps protection of organic matter only. Other threats to soil are not addressed.
Opportunities	**Threats**
Development of handling guidelines will help to ensure the most beneficial use of soil material recovered. Such guidelines would enhance the effectiveness of this instrument. The regulation can be in some extent a good practice for all mentioned impacts, depending on local circumstances and context. Enhanced soil reclamation of degraded soils in areas were application of top soil is the only solution – soils with damaged surface due to flooding, severe erosions, excavation works.	More specific regulations are required regarding management of soil material recovered Large distance transport of recovered soil can be an economic issue, which leads to stockpiling instead of effective re-use of topsoil. No problems with acceptance can be expected. If the regulation is not properly applied, stockpiling can lead to loss of significant resource critical for soil reclamation and cleanup projects.

Conclusions

It is a good practice instrument in principle.

Guidelines for topsoil handling are critical for a proper implementation of the instrument. Long term stockpiling of recovered soils should be prohibited.

We assess it as good practice instrument with development potential focusing on the best use of soil material recovered.

9. Slovakian instruments

In Slovakia 19 instruments were identified on national level and two instruments for Bratislava. Six instruments were selected for the SWOT analysis.

The selection of instruments for the SWOT analysis comprises:

1. Law on protection and use of agricultural soils and about integrated prevention and control of environment pollution
2. Decree of determined amount of payment and specification of payment for agricultural land consumption
3. Law on impacts assessment on environment
4. Law on protection and use of agricultural soils (recultivations)
5. Regulation urban zoning and planning and its documentation
6. Regulation on land protection at urban planning and zoning and at consumption and forest land functions restriction

9.1 Law No. 220/2004 from March, 10th, 2004 on protection and use of agricultural soils and on change of the Law No. 245/2003 about integrated prevention and control of environment pollution

Zákon č. 220/2004 z 10. marca 2004 o ochrane a využívaní poľnohospodárskej pôdy a o zmene zákona č. 245/2003 Z.z. o integrovanej prevencii a kontrole znečistenia životného prostredia

Short description of the instrument

Objectives are agricultural soils, protection of soil properties and functions and sustainable management, protection of environmental functions, protection of agricultural land against of land consumption and sanctions for violation

This instrument is applying by land offices predominantly on the regional and district levels, and by farmers

Status	Type of intervention
LEX nat.	Goal to protect soil

Execution

Sustainable management is executed according to law: protection of agricultural soils against soil degradation (soil erosion, soil compaction, organic matter balance, risk elements). For the protection aspects solution the SOIL SERVICE institution was established. Protection of soil at territorial planning activities, changes in land use and land consumption confirmation is introduced incl. requirements for its execution. Executive institutions are land offices.

Strengths	Weaknesses
The instrument can serve as only one tool focusing on soil protection	The law protects only agricultural soils, not urban or forest soils.
The agricultural soils are protected against soil consumption mainly of good quality (first 4 soil quality classes from 9) by decision making of land offices.	The main weakness is low performality of the law without marked sanctions
It protects soil against soil degradation processes: soil erosion, soil compaction, risk elements, organic matter decline. Soil sealing not.	Soil service cannot solve all degradation form occurring in the land. Its executive is very restricted.(without sanctions)
The instrument functions well for soil sealing. No data.	The instrument does not consider soil sealing because of agricultural land is regarding. Also data about soil sealing do not exist.
	Risk elements are considered only for agricultural land, not for urban soils. There is no differentiation for different land use contaminants limits.

Opportunities	Threats
The potential to improve this instrument is quite high. It could be extended on urban soils, their relative changed functions and evaluation (could be considered also forest soils)	The main constrains are resort interests who will protect what? Urban areas are under ministry of environment, agricultural and forest land under ministry for land management.
The executive could be extent on urban planning office	This can result in problems in its effectiveness.
As good practice could be serve for soil compaction, loss of organic matter and soil erosion.	If the instrument is not applied (properly) soil degradation and consumption would increase.
Urban soils in Slovakia are not protected inside of urbanized areas, only agricultural soils. Forest soils are part of the Forest Law, not protect individually. Protection of the whole land could be more effective solution.	

Conclusions

The law is a good practice instrument

For the further development/appliance it is recommended to enhance its potential also for urban and forest soils, i.e. general for the whole soils.

It is an instrument with development potential

9.2 Law No 219/2008 from May 21st 2008, by what is changed and completed law No. 220/2004 Z.z., §12 a 17, associated with … Decree of government No. 376/2008 from September, 10th, 2008, by what there is determined amount of payment and specification of payment for agricultural land consumption, §1 and § 2

a) Zákon č. 219/2008 z 21.mája 2008, ktorým sa mení a dopĺňa zákon č. 220/2004 Z.z., §12 a 17, spojený s …
b) Nariadenie vlády č. 376/2008 z 10. septembra 2008, ktorým sa ustanovuje výška odvodu a spôsob platenia odvodu za odňatie poľnohospodárskej pôdy

Short description of the instrument

Economical instrument for agricultural soils protection

The instrument is applying for all people who want to take agricultural land for non-agricultural purposes i.e. buildings, industrial, traffic, mining etc. This relatively new instrument is coming into practice.

Status	Type of intervention
LEX nat.	Goal to protect soil

Execution

These instruments are applied in combination with Law No. 220/2004 on soil protection.

Payment for agricultural soil consumption (permanent or temporary) according to soil quality classes (first 4 classes from 9), consumption to be exempt from payment, the degree specifies payment amount for 4 soil quality classes: 1st class: 15 EUR/m^2, 2nd class: 12 EUR/m^2, 3rd class: 9 EUR/m^2, 4th class: 6 EUR/m^2. Responsible executive decision-making offices are land offices acting under Ministry for Land Management of Slovak Republic

Strengths	Weaknesses
The instrument tools can protect the most fertile soil in the country by economical. The directive measures to regulate building and other activities selecting agricultural land for less fertile and less appropriate for farming. Thus, it contributes to soil protection substantially. It focuses on land consumption. However, also soil of good quality can be degraded by any soil threats. Indirectly to all types of impact (compaction, sealing, pollution, loss of organic matter, erosion) are covered by this instrument.	As it is a relative new instrument, there is no experience in practice. Moreover, some not well defined exceptions from the payment duty are presented. This instrument is referring only to the extent of soil consumption regarding 4 classes of the most fertile soils. Soil sealing can be considered as indicator for farmland consumption
Opportunities	**Threats**
The payment for agricultural land consumption is very good practice instrument, because it focuses on the prevention of agricultural land reduction. The effectiveness of the instrument could be increased e.g. by higher payments per square meter and strict rules for the justification of land consumption. The payment for agricultural land consumption can contribute to reduce farmland consumption.	In practice, it is essential to keep strictly the rules for the land consumption permission There exist problems of acceptance, mainly from land owners. If the instrument is not applied properly, extremely farmland consumption without any conception could caused land degradation and non-sustainable development.

Conclusions

The payment for agricultural land consumption is the best practice to avoid excessive land take.

The challenge for the future is to realize a good practice and support its performance.

9.3 Law No. 24/2006 from December 14, 2005 on impacts assessment on environment

Zákon č. 24/2006 zo 14 decembra 2005 o posudzovaní vplyvov na životné prostredie

Short description of the instrument

EU legislation adopted on the Slovak conditions, it includes Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA).

The law is applied often, as these assessments are needed for each building construction or whatever building, industrial energetic, traffic, mining etc. actions on landscape

Status	Type of intervention
LEX EU LEX nat.	impact assessment

Execution

The law is efficient for soil protection only in combination with the refusal of a building permissions.

Soil in EIA is an inevitable part of general environmental impact assessment for each planned activity in the county.

Strengths	Weaknesses
There are very good recognizable indicators and a comprehensive methodology. The assessment takes soil quality into consideration due to the existing legislation. It focuses on regulation of non-agricultural activities. Soil erosion and contamination are only covered by risk elements. For compaction, sealing, loss of organic matter it functions well.	The methodology for some aspects of soil assessment is not well prepared, e.g. not all soil threats are evaluated. Not all aspects of soil threats are considered. Compaction, sealing, loss of organic matter are not covered. Thus, for these types of impact the instrument is less suitable. Urban areas are difficult to assess because there are no data in most cases.
Opportunities	**Threats**
The impact assessment on the environment has potential for better assessment of soil and urban soils It is a good practice instrument for all impacts.	A core threat in developing this instrument into a good practice instrument for soil management and protection is to fill in the existing gaps in soil quality assessment. If the instrument is not applied (properly) just a partial assessment is done and you do not get a not full image about soil properties.

Conclusions

The impact assessment on environment is good practice instrument

For the further development it is recommended to develop more properties to assess soil quality incl. urban soils

It is an instrument with development potential.

9.4 Regulation of Ministry for land management of Slovak Republic No. 508/2004 z from August 23, 2004, by what it is executing the Law No. 220/2004 on protection and use of agricultural soils (recultivations)

Vyhláška Ministerstva pôdohospodárstva SR č. 508/2004 z 23. augusta 2004, ktorou sa vykonáva § 27 zákona č. 220/2004 o ochrane a využívaní poľnohospodárskej pôdy

Short description of the instrument

Objectives of the instrument is agricultural soil: topsoil removal, reuse of topsoil, recultivation process rules and impact assessment at buildings activities

The instrument is often applying by farmers and projects organizations to establish inevitable steps at topsoil (humus horizon) removal, technical and biological recultivation

Status	Type of intervention
LEX nat.	Goal to protect soil impact assessment

Execution

Execution of § 27 of the Law No. 220/2004 on soil protection

Project organizations carry out projects referring to topsoil removal and recultivation of temporary taken land (soils) which are ordered by land offices. The background is elaborated and approved topsoil removal or recultivation project.

Strengths	Weaknesses
This instrument is applied very often in practice and no problems at its execution can be observed. Soil is protected in sense to keep former quality of taken soil. It contributes to soil protection by avoiding agricultural land reduction. At topsoil removal and recultivation processes almost all aspects are considered: compaction, pollution, loss of organic matter, erosion, without sealing The instrument functions well for all types of impact compaction, pollution, loss of organic matter, erosion except sealing.	To keep the former quality of soils is not possible in some cases, because of different types of topsoil material and some problems at recultivation performance (subsidence, water streams disruption etc.. Soil sealing is not covered by this instrument.
Opportunities	**Threats**
This instrument is a good practice document. All aspects of soil threats have to be taken into consideration. The application of this instrument contributes to keen quantity and quality of soils.	There are only small parts of the improvement. If the instrument is not applied there would be an extreme reduction of the whole farmland

Conclusions

Best practice instrument

9.5 Regulation Of Ministry for environment of Slovak Republic No. 55/2001 from January 2001 on urban zoning and planning and its documentation

Vyhláška Ministerstva životného prostredia SR č. 55/2001 z 25. januára 2001 o územno-plánovacích podkladoch a územno-plánovacej dokumentácie § 2-18

Short description of the instrument

Objectives is whole land incl. agricultural forest and urban soils
This instrument is applied by farmers, urban planners and urban architects

Status	Type of intervention
LEX nat.	land use regulation/zoning permission

Execution

This instrument has to be in coinciding with the Law No. 50/1979 called like "building law". The regulation is obligatory for urban planners and architects.
The instrument refers to the content and manner of elaboration of background material preparation and documentation in detail. Is based on development concept of cities, regions etc.

Strengths	Weaknesses
This instrument is comprehensive and good elaborated. In the background documentation aspects of agricultural and forest land protection have to be covered. A Coefficient for sealing is introduced. The instrument covers only soil sealing.	The coefficient of sealing is ratio between building area and green area in the urban project. In many cases is is not kept. Compaction, pollution, loss of organic matter, erosion are not covered. Thus, for these types of impact the instrument is less suitable.
Opportunities	**Threats**
It is a good practice instrument There is a potential for enhancing the soil quality by the introduction and a better ratio for open soil area at urban areas For all aspects of soil threats are not be taken into account the instrument could be a good practice instrument. By application of this instrument a better understanding of the functioning of urban soils in urbanized areas could be achieved.	The threats in developing this instrument into a good practice instrument for soil management and protection are to introduce more information about soils There could be problems of acceptance from planners and developers. if the instrument is not applied (properly)this could lead to totally sealed urban areas.

Conclusions

It is a good practice instrument
For the further development/appliance it is suggested to include more soil properties and functions and developing of the sealing ratio.
It is an instrument with development potential

9.6 Regulation of Ministry for Land Management No. 12/2009 fro January 15, 2009 on the land protection at urban planning and zoning and at consumption and forest land functions restriction

TVyhláška Ministerstva pôdohospodárstva č. 12/2009 z 15. januára 2009 o ochrane pozemkov pri územno-plánovacej činnosti a pri vyňatí a obmedzení plnenia funkcií lesov

Short description of the instrument

Objectives are forest areas, establishment and extent of mine areas for natural resources and requirements for permission.

This instrument is applied by farmers

Status	Type of intervention
LEX nat.	land use regulation/zoning permission

Execution

This instrument has to be in coinciding with the Law No. 326/2005 called like "forest law"

The instrument is executed by the forest land offices.

Strengths	Weaknesses
The strengths and advantages of this instrument are the adjustment of relationships between urban planning and zoning and forest protection. The objectives of the forest protection is forest functions The Instrument can protect also forest soils in relation to forest functions.	The forest soil is not especially protected as well.
Opportunities	**Threats**
Good practice instrument for land use There is potential for enhancing the effectiveness of the instrument, mainly for aspects of forest soil protection.	Forest soil management could be improved to regard forest soil threats If the instrument is not applied (properly) forest land would be sealed

Conclusions

Good practice instrument

Instrument with development potential

10. Slovenian instruments

In Slovenia nine instruments were identified on national level and one instrument for the Municipality of Celje. Seven instruments were selected for the SWOT analysis.

The selection of instruments for the SWOT analysis comprises:

1. Decree on Spatial order of Slovenia
2. Environmental Law
3. Spatial planning Act
4. Water act
5. Decree on burdening of soil
6. Decree on the limit input concentration values in soil
7. Agricultural land Act

10.1 Decree on Spatial order of Slovenia

Uredba o prostorskem redu Slovenije

Short description of the instrument

This decree lays down the rules for regulating spatial planning. The rules for regulating spatial planning are general spatial planning rules, the rules for the design of spatial systems and rules for planning and building facilities.

All holders arranging spatial development and infrastructure have to ensure sustainable land-use spatial development. Besides that when preparing spatial plans spatial planners have to consider in decree written demands (comprehensive preparation of spatial systems, coordinated positioning of activities, provide spatial coherence and consistency of economic, social, cultural and environmental policies,…)

Decree is applied in the phase of preparation of new spatial documents on municipality and state (also regional, when Slovenia will get regions) level by spatial planners who are authorized to prepare new spatial documents.

It Is applied often when making changes or new spatial plans.

Status	Type of intervention
Nat. guideline	Goal to protect soil land use regulation/zoning protected areas basic, obligatory guidelines for preparing spatial documents

Execution

This instrument provides general orientations and restrictions for preparation of spatial documents which have to be done in accordance with Rules on the content, format and drawing-up of municipal detailed spatial plan.

Its guidelines for preparation of new spatial documents are taken into account when preparing them under Spatial planning Act and Rules on the content, format and drawing-up of municipal detailed spatial plan.

Strengths	Weaknesses
Its main strength is its general orientation for all spatial documents that has to be taken into account. Unfortunately is has no important strengths as regards soil protection. We can point out only the fact that in residential areas must be at least 60 % of unsealed parcel. The decree requires preservation or establishment of a balance between built and green spaces and other public open spaces in the city. Their areas provided by spatial plans should not change to another dedicated use, except if it is provided an equivalent-sized and purpose suitable location to replace the abandoned area of green spaces. Sealing, erosion are covered. The Instrument functions well mostly only for sealing as it sets maximum % of sealed land/soil in residential areas, city area, mixes areas.	As this decree is general one gives only basic indirect guidance for soil protection as soil is not mentioned directly, only indirectly as un-built areas within city borders, green areas, open public spaces…) Soil is not mentioned directly, only as green and open areas in the city, retention areas. Compaction, pollution, loss of organic matter are not covered. The instrument is less suitable for compaction, pollution, loss of organic matter. Loss of organic matter and pollution are not the topic of this decree (is or should be covered by other acts), compaction is not covered, but could be at least a bit in connection with retention areas.
Opportunities	**Threats**
There should be put in more precise function/role of soil in city conurbation – not to be mentioned only as green area/retention area. As it provides only general orientation for space documentation there could be written some basic on function of soil in urban areas which have to be taken into account in more detailed acts, rules-ways to replace sealed, retention, green areas Currently the instrument a good practice instrument only for sealing. It could be improved in erosion thematic and compaction. As sealing of soil is set for different land uses for different %, there could be more on soil functions replacement (green roofs)	Unsatisfactory replacement of sealed, polluted soil as there is not enough inspection control, spread of settlements into agricultural, green areas even this is not excusably. Lack of control could lead to problems in effectiveness. Probably there would not be problems of acceptance, unless there are some politics behind. As it is general decree for experts that work o spatial document preparation. If the instrument is not applied (properly), especially in city areas, on best locations with view, could come to oversealed land to get as much profit out of it for investors.

Conclusions

At least soil sealing, retention areas, regulation on damaged areas are partly covered, but as always it can be done better.

Recommendations for the further development/appliance are to write on soil functions more exactly and how to substitute it in some cases when it is possible.

It is an instrument with development potential because it has the opportunity to be written even better, more exactly for the role of soil protection and its functions in urban areas.

10.2 Environmental Law

Zakon o varstvu okolja

Short description of the instrument

This law is an umbrella law, which governs the actions of environmental protection, environmental monitoring and information, economic and financial instruments of environmental protection, the environmental protection public services and other protection issues related with environment.

Objectives of this instrument:

1. Prevention and reduction of the environment (environmental permissions, determination of limit values of emissions)
2. maintaining and improving environment quality (act is legal basis for issuing regulations for setting standards of the quality of the environment, warning and critical levels, rates of reduction of environment pollution and corelated measures, act sets the areas of downgraded environment)
3. sustainable use of natural resources (provides a comprehensive assessment of the spatial plans impact on the environment, management with waters, forests, fisheries, mining, agriculture, energy, industry, transport, waste and waste water management, supply of the population with drinking water, telecommunications and tourism – provides environment impact assessments for facilities)
4. provision of monitoring environment state and management with maintenance of an environment information system
5. abolishment of consequences of the environment burdening, improvement of the demolished ecological balance and re-establishing of its regenerating abilities

The Act applied by Ministry of Environment and Spatial Planning, in a smaller proportion also municipalities (the process of adopting spatial planning acts and preparation of municipal programs of environmental protection, environmental monitoring).

It is applied often.

Status	Type of intervention
LEX nat.	impact assessment monitoring permission subsidy, public supply tax regulation

Execution

This instrument is to be applied in combination with others in the process of adopting spatial planning acts; with inspectors supervision by soil excavations…

The aim to protect the soil under the Act is made in cases when there needs to be made comprehensive assessment of the spatial plans impact on the environment which is the basis for the adoption of spatial implementing act.

Strengths	Weaknesses
Combined with Spatial Planning Act the Environmental Law indirectly prevents pollution and unreasonable (larger than planned/allowed) sealing. (environmental permits and CEA). It enables adaptation of targeted legislation/acts which prevent soil contamination, remediation of degraded soils, soil organic matter conservation... It contributes to soil protection indirectly, with Decrees for soil excavations, and on sealing in combination with Spatial planning act. It represents a ground document. It covers only pollution It functions well IN combination with Spatial planning act only on sealing.	The act is too general. Missing Special decrees for the protection of soil are missing. Weak inspection supervision on soil protection in practice. Compaction, erosion and loss of organic matter are not covered. It lacks effectiveness on the field of soil compaction, because it does not directly restrict intensive agriculture. It is similar with soil erosion (which is often a result of unbalanced production intensity) It does not refer to soils directly. Many important but unfortunately border contents (not covered by general acts) which remain undefined (“gray areas”).

Opportunities	Threats
Soil is a natural resource and at the same time basic source of food for the county. The legislation should that for establish the objectives of sustainable use of natural resources (including soils!), encouraging sustainable production and consumption reducing the environmental risks. It should also establish adequate system of permits/fees when natural resources are exploited for economical purposes. There is significant prospect! potential for enhancing the effectiveness of the instrument In combination with Decree on the limit of input concentrations… for pollution of soils, otherwise only for water and air pollution the instrument is or could be a good practice instrument. Allows adoption of special rules that prevent contamination of soil. This law also allows the introduction of environmental protection to other governmental sectors (agriculture, transport, tourism ...)	Poor control over the implementation of the act. Unsustainable use of natural resources, (soil) There could be problems in effectiveness. As many times environmental/sustainable use of natural wealth, also soil, the instrument is seen by developers/stakeholders only as barrier-additional experience in whole project. If the instrument is not applied (properly the contamination of soil would increase, more loss of organic matter. Sanitation of degraded areas would not be done.

Conclusions

This law is an umbrella law (a good foundation), which legislates various actions of environment protection, environmental monitoring and information, economic and financial instruments on environment protection, public services of environmental protection and other with environment protection correlated issues.

It is often too general and would require more detailed acts that would deal with more detailed sector's topics.

Unfortunately it is not the instrument of best practice but often used because it is the only one available.

This is a good foundation, base piece of legislation with many prospects for its development. In lines with this instrument adoption of special rules to prevent soil contamination should be established along with introduction of environment protection to other sectors of government (agriculture, transport, tourism ...). It is our opinion that such measures should be additionally accompanied by more frequent supervision and control.

Not adequate for soil protection, because it is an instrument of development potential.

10.3 Spatial Planning Act

Zakon o prostorskem načrtovanju

Short description of the instrument

This Act regulates spatial planning by determining types of spatial acts, their contents, correlation and processes for their preparation and adoption.

The objective of the Spatial planning Act is to provide a coherent spatial development with treatment and coordination of different needs and interests, public benefits in the areas of environmental protection, nature conservation and cultural heritage, protection of natural resources, protection against natural and other disasters.

The Spatial Planning Act is applied when making changes or new spatial plans by:

- Ministry of the Environment and Spatial planning when they conduct the process of state spatial plan adoption,
- municipalities for municipal spatial plans and planners who are authorized to prepare new national and local spatial documents.

Status

LEX nat.

Type of intervention

Goal to protect soil
land use regulation/zoning
protected areas
impact assessment

Execution

This instrument provides a general orientation and restriction for preparation of spatial documents which have to be in lines with rules, content, format and drawing-up detailed spatial plan on municipal level.

It gives a frame for all newly developed Spatial planning Acts or municipal detailed spatial plan.

Strengths

Its main strength is that it gives a list of guidelines that all spatial documents should follow.

Unfortunately it has no other strengths. The only criteria set is that residential areas (permanently sealed land) must not cover more than 40 % of the developed site. 60% of opened space is then defined in additional acts which specify the percentage of green areas, car parking, parks… The content of these acts defer from municipality to municipality.

The decree defines a balance between built and green spaces and other public open spaces in the city. Use of green areas provided by the city's spatial plan should not be changed, except in cases when an equivalent-sized area of the same purpose is provided.

Sealing and erosion are covered.

It functions well mostly only for sealing, as it sets maximum % of sealed land/soil in residential areas, city area, mixes areas.

Weaknesses

As this decree is general one it only gives a basic guidance for soil protection. Soils is not mentioned directly but rather indirectly as "un-built areas" within city borders, green areas, open public spaces…)

Soil is not mentioned at all, only as part of green and open areas in the city, retention areas…

Compaction, pollution, loss of organic matter are not covered

There is no aspect of soil quality mentioned. That for there is no refer to soil properties (e.g. Compaction, Organic matter content, heavy metal content-pollution…)

It clearly defines only sealing aspect in terms of land use type.

For all described above (compaction, pollution, loss of organic mater) the instrument is less suitable. These should be effectively covered by additional piece of legislation/acts. Water retention areas (flood plains) mentioned, only partly cover the mentioned issues.

Opportunities

There should be put in more precise function/role of soil in city conurbation – not to be mentioned only as green area/retention area.

As it provides only general orientation for space documentation there should be included basic urban soil function to be taken into account and be included in more detailed acts, rules/legislation

Currently the instrument is a good practice instrument only for sealing, could be improved. Comprehensive soil functions to be included.

As sealing of soil is set for different land uses for different %, there could be more on soil functions replacement (green roofs)

Threats

Unsatisfactory replacement of sealed, polluted soil as there is not enough inspection control, spread of settlements into agricultural, green areas even this is not excusably.

Lack of control could create problems in effectiveness.

There are probably no problems of acceptance, unless politics would find this issues "problematic". Currently general decree for experts work on spatial document preparation.

If the instrument is not applied (properly), especially in city areas, on best locations over-sealing due to maximization of the profit by the developers and investors

Conclusions

At least soil sealing, retention areas, regulation on damaged areas are partly covered, but as always it can be done better.

recommendations for the further development/appliance are: Exact definition of soil functions and their role in spatial development. Ways how to make substitutions and when is that possible.

Instrument with development potential, because it has the opportunity to be written even better, more exact for the role of soil protection and its functions in urban areas.

10.4 Water Act

Zakon o vodah

Short description of the instrument

The water law regulates the management of sea, coastal, inland surface and underground water.
Protection of water resources, costal and water areas and flood land.
Applied by the Ministry of the Environment and Spatial planning and the Environmental agency of the Republic of Slovenia rather often.

Status	Type of intervention
LEX nat.	protected areas permission

Execution

In combination with Spatial planning act it has an influence on sealing. Near riverbanks or on flood plains there are building restrictions in place (if the intervention/development is located on water protection area or on the water, you need to get a special water permission)

Strengths	Weaknesses
On flood plains all interventions and activities that would have impact on environment and water are forbidden Protection of water resources includes soil erosion that impacts surface and underground water (landslides), and coastal erosion on the sea shore. The Water Act has a very big influence on spatial planning in Slovenia. Erosion and sealing are covered. It is important to prevent all activities that would cause/ start soil erosion. Sealing, because development close to water sources and on floodplains is forbidden.	It protects only costal and water areas (riverbanks, flooded areas, coastal areas) There is almost no direct influence on soil except erosion, more on spatial planning. Compaction, pollution, loss of organic matter are not covered. The instrument is less suitable for sealing. On protected areas building is not allowed.
Opportunities	**Threats**
The Water Act does not talk about relationship between water and soil, it is limited only on water issues. There is potential for enhancing the effectiveness of the instrument It could be a good practice instrument for sealing. Protection of water, coastal and flood plains can be achieved by application of this instrument.	No problems in effectiveness, because before you can do anything near water or coastal areas you need to get water permission. However, there could there be problems of acceptance. If instrument is not applied we can expect more erosion, landslides and more developments on protected areas.

Conclusions

The Water act primary deals with protection of water only. It does not consider the close relationship between water and soil.
It could be developed in the way to also include water and soil close interactions.
Not adequate for soil protection

10.5 Decree on burdening of soil with waste spreading

Uredba o obremenjevanju tal z vnašanjem odpadkov

Short description of the instrument

This Decree lays down the conditions relating the burdening of soil with waste disposal and conduct with soil excavations.

The aim is to improve the ecological status of soil (re-cultivation of soil, raise of soil level, new soil on construction land fill)

Decree is used by Ministry of Environment and Spatial Planning (when issuing environmental permits for the excavations input in/on soil).

It is not applied very often

Status	Type of intervention
LEX nat.	Goal to protect soil monitoring permission

Execution

This decree does not ensure sustainable land use.

The aim to protect soil is on the basis of this Decree achieved when interventions in the space (like sealing free green area) occur and investor has to make review of the soil quality and pollution to handle it properly.

Strengths	Weaknesses
This Decree lays down mandatory practice in the planning and execution of the soil input on another soil (ground) and prevents contamination of soil and allow soils recultivation (environmental permits) This Decree protects soil from waste input and dangerous substances with it, unless waste is treated and unpolluted and allows recultivation of soils. It prevents soil pollution with dangerous substances because it prevents disposal of contaminated soil excavations on agricultural land. Pollution is covered by the Decree on burdening of soil with waste spreading. Thereby, it functions well, as it provides limits for pollutants that can be entered with brought soil.	The impact of decree on soil is only partial. The aim would be achieved if an environmental permission for an input of soil excavations on another place (soil) is obtained already in the stage of issuing a building permissions. Weak inspection control on soil protection. As result soil excavations are deposited uncontrolled where investors find appropriate place. Compaction, sealing, loss of organic matter, erosion are not covered Lack of effectiveness especially in compaction and sealing as it is not covered at all in this Decree.
Opportunities	**Threats**
Development potential of this instrument is currently high as for treatment with polluted soil and wastes on soil base it has specified values of heavy metals and other pollutants that must be within allowed values otherwise is soil treated as waste and is not allowed anymore to deposit everywhere. There are opportunities to improve the effectiveness of this regulation if the provisions from this Decree would also be embedded into the Construction Act (environmental permission for the input of soil excavations on another soil ground should be part of the documentation for building permissions). The instrument is a good practice instrument for pollution. By application of this instrument there is only partly supervision over soil excavations and movements, if inspection supervision would be much better and effective.	Unsustainable use of natural resources (soil...) Yes, lack of supervision could create problems in effectiveness. Due to inputs of contaminated soil excavations increased soil pollution could come up, if the instrument is not applied (properly).

Conclusions

This Decree lays down mandatory practice in planning and execution of soil input on soil ground on other location, prevents soil contamination and allows soil re-cultivation (environmental permissions). Unfortunately does not provide sustainable land use and does not cover compaction, sealing, loss of organic matter and erosion of soil.

Is not the best instrument of good practice of overall protection of soil.

It is not directly usable for soil protection.

Not adequate for soil protection

10.6 Decree on the limit input concentration values of dangerous substances and fertilisers in soil

Uredba o mejnih vrednostih vnosa nevarnih snovi in gnojil v tla

Short description of the instrument

The Decree lays down limit input values of dangerous substances and fertilizers in soils trough the application of the sewage sludge, compost or mud from the river beds and lakes, and limit input values of dangerous substances and fertilizers in soils by irrigation and fertilization of plants, methods of input, degree of reducing intake and other measures concerning the entry of dangerous substances and fertilizers in soil.

The objectives of this instrument are:

- to reduce and prevent water pollution caused by nitrates from agricultural sources,
- to prevent the pollution of soil by dangerous substances (heavy metals, nitrates),
- to encourage the proper use of compost, manure/slurry and sludge from the water treatment plant.

Decree is used by Ministry of Agriculture, Forestry and Food in cooperation with Ministry of Environment and Spatial Planning.

It is applied often.

Status	Type of intervention
LEX nat.	Goal to protect soil land use regulation monitoring permission

Execution

The Decree on the limit input concentration values of dangerous substances and fertilisers in soil is applied in combination with others to result in sustainable soil protection.

For application of various substances into soils it is necessary to first obtain a permission (based on information of the content of dangerous substances in the mud from water treatment plants, compost, mud from river beds or lakes).

Strengths	Weaknesses
Prevents excessive soil pollution with dangerous substances (heavy metals) – needed permission for entry Prevents input of dangerous substances in soil. Contributes to soil protection directly by issuing permissions for dangerous substances input in soil. Focuses on soil pollution. It functions well at soil pollution as it provides thresholds values. It also represents the most direct threat to humans.	Decree does not provide monitoring soil before entering and after entering the sludge, compost in soil. Inefficient control, hence soil protection. Spread inspector's jurisdiction. Compaction, erosion, sealing and loss of organic matter are not covered. There is no national monitoring system in place at the moment. For these types of impact the instrument is less suitable.
Opportunities	**Threats**
Development potential of this decree is small (partial). Yes. Current weak and spread inspection (jurisdiction) of soil protection should be strengthened, also monitoring of soil before/after input. good practice instrument only for soil pollution prevention As it is necessary to get a permission for the input of sludge from water treatment plants, compost, river bed mud and manure in soil, is soil in this way protected from potential contamination with heavy metals and nitrates	The main threat is a very dispersed inspection control (only three inspectors for whole country!) There could be problems in effectiveness? If the instrument is not applied (properly), soil would get more polluted with dangerous substances (heavy metals, nitrates) due to uncontrolled input of sludge from water treatment plants, compost, river bed mud and manure.

Conclusions

Decree is not the best manner to solve the real problems, because it does not contain many provisions which would allow more comprehensive soil protection.

Introduction of mandatory soil monitoring system after the application of sludge from water treatment plants, compost, river bed mud.

Not adequate for soil protection, because, it does not cover comprehensive soil protection.

10.7 Agricultural Land Act

Zakon o kmetijskih zemljiščih

Short description of the instrument

The Agricultural Land Act covers use of agricultural areas, their protection, sales and purchase of agricultural land.

The Agricultural Land Act is applied by the Ministry of Agriculture, Forestry and Food. Furthermore, the municipalities need to implement it when preparing new spatial plans. Thus, it is applied often.

Status

LEX nat.

Type of intervention

land use regulation/zoning

protected areas

permission

Execution

Act would be efficient if there were more detailed provision.

Strengths

protection of agricultural land

even undeveloped building land should be treated as agricultural land until building permission is issued

for all agricultural land pollution, degradation must be avoided and there should be conditions for agricultural development as well as keeping the soil fertility on adequate and constant levels

to ensure permanent favourable soil fertility of agricultural use we need to prevent compaction, erosion and keep soil organic matter content stabile. Enhanced decomposition of organic matter should be balanced with sufficient input of plant residues. Sufficient levels ensure good fertility, water retention capacity (flood risk compensation).

defines the circumstances in which agricultural land use can be changed into housing development.

It contributes to soil protection through spatial planning restraints – conditions for change of agricultural land status.

Only sealing is covered. For this aspect is functions well.

Goal of the act is to protect fertility of agricultural land.

Effective protection of agricultural land against non-agricultural land uses (housing, infrastructure development…)

Weaknesses

The Agricultural Land Act is just a general act. There is a lack of detailed provision.

All aspects of soil protection are covered.

The instrument is less suitable for sealing.

Agricultural land is divided only into two groups:

– areas of first quality agricultural land,

– areas of second quality agricultural land.

It does not set any other qualifiers; eg. soil fertility, biological and environmental functions of soils…

Lack of supervision. Easy to avoid legal aspects.

Opportunities

There is potential for enhancing the effectiveness of the instrument with further development.

The instrument is a good practice instrument for sealing.

By application of this instrument a general protection of best quality agricultural land can be achieved.

Threats

There could be problems in effectiveness

There are problems of acceptance.

If the instrument is not applied (properly), degradation and destruction of agricultural land would increase.

Conclusions

In general the Agricultural Land Act is a best/good practice instrument, because best agricultural land is protected.

All soil functions hence soil properties should be considered in future. Best quality land should be protected by all means. Change of agricultural land use should be ensuring future prospects for food production (preservation for future generations)

11. Conclusions

11.1 Characterisation of groups of instruments

As already written down in the overview table in chapter 3, page 7f, the analysed instruments can be summarized into the following groups:

- Spatial planning and building legislation
- Soil protection acts
- Nature protection, water and forest acts
- Acts for agricultural land
- SEA/EIA
- Subsidies/Penalties

Generally the analysed instruments are EITHER adequate for building land OR for agricultural land OR for green land and protected areas. The one and only best practice instrument does not exist. Some best practice elements were identified and listed in chapter 11.2. First the different groups of instruments are described.

Spatial planning and building legislation

Spatial planning and building regulations are important for urban areas and build up land. They mostly do not have explicit soil protection contents but sealing can be restricted more or less efficiently (c.f. the Building Regulation of the Municipality of Milan for best practice elements).

Soil protection acts

The partners had a look at a lot of acts explicitly dealing with soil protection. These instruments include very detailed measures for all types of impact (mainly pollution, loss of organic matter, erosion). Still most of them – 12 instruments were analysed – are either not applied often (e.g. the Austrian Soil Enhancement Plan or the Rehabilitation Instrument for Polluted Sites in the Piemonte region) or the implementation is not obligatory (e.g. the Protocol Soil conservation of the Alpine Convention in Italy). Some of them are just not monitored or in an insufficient way.

Nature protection, water and forest acts

12 acts on nature protection water and forest were analysed. These do not directly focus on protection of soil. Protecting soil is a side-effect of the protection of natural resources as e.g. water, biodiversity, etc.. In contrast to the spatial planning and building legislation these instruments mainly concentrate on areas outside settlements.

Acts for agricultural land

There exist various legislations in order to regulate the use of agricultural land. Often these regulations focus on soil quality and soil pollution often combined with the definition of threshold for relevant pollutants as well as on erosion. Moreover, these acts can foresee measures as such as crop rotation, limitation of fertilizers or planting of shrubs or windbreakers in order to protect soil in agricultural areas.

SEA/EIA

In the assessment of plans and programs through a Strategic Environmental Assessment as well as in the assessment of large scale projects through an Environmental Impact Assessment the impact on various functions of soil has to be checked systematically. These assessments enable the administrations conducting EIAs resp. SEAs to counter-check potential impact on soil.

However, usually, soil is not the core issue of a SEA or an EIA. Furthermore, qualitative thresholds according to land consumption or soil sealing are missing, whereas e.g. exact and even European wide similar thresholds concerning air quality exist.

Subsidies/Penalties

Subsidies for a special use of agriculture as well as for housing have direct guiding effects for the land use and therefore its consequences on soil protection. Subsidies can be easily adapted to different goals.

However, especially subsidies for agriculture only last as long as there is a money flow to the farmers. If the system of subsidies changes, the farmers can easily and quite fast adopt their land use to a less suitable according to soil protection goals.

11.2 Interesting best practice elements

Among the analysed instruments various best practice elements can be found (overview table in chapter 3). However, we want to focus on some instruments that contain unconventional elements for soil protection respectively soil management and therefore could be of special interest for other countries.

Soil Enhancement Plan (Upper Austria)

The Soil Protection Act of Upper Austria foresees the implementation of Soil Enhancement Plans. The public authority is entitled to ask the land user to deliver a plan containing soil enhancement measures, if the thresholds of soil measurements are exceeded, any other negative impact on soil is identified such as erosion or compaction or enhancement of soil quality seems necessary. The land users plan shall include measures for soil enhancement and soil sanitation within a determined period. In addition to that a soil protection consultation centre was established. Persons concerned are informed before their interference. Within the information

less harming solutions for planned interventions are elaborated. Up to now such activities were undertaken to counteract erosion problems.

For the detailed description see table 4.5 on page 16.

Guideline for the assessment of soils according to their performance (Germany)

The guideline for the assessment of soils according to their performance provides methods by which soil functions have to be assessed. 5 soil functions are considered:

- "Natural soil fertility"
- "Habitat for natural vegetation"
- "Regulation of water balancing"
- "Filter and buffer for pollutants" and
- "Archive of natural and cultural history"

The application of the guideline fulfils the requirements concerning evaluation and assessment of soils according to the building and nature legislation. By the clear and comprehensive assessment of the performance, high-quality soils can be identified and taken into account in the planning processes. This allows steering soil consumption on less valuable soils, if planning alternatives are available.

The soil valuation is a prerequisite for quantitative assessment of the impact of encroachments and therefore a prerequisite for the determination of compensation requirement. This is determined in the guideline "The environmental compartment soil in the compensation regulation".

For the detailed description see table 6.5 on page 31.

Guidelines for provincial assessment on compatibility of municipal planning tools with the Provincial Land Coordination Plan (Italy)

The "guidelines for provincial assessment on compatibility of municipal planning tools with the Provincial Land Coordination Plan" are internal guidelines for technicians of the Provincial Administration helping them to evaluate municipal master plans and to check conformity to the Provincial Land Coordination Plan (PLCP). The instrument itself completes the already existing PLCP and compensates the lack of conformity to the regional planning level. It is a temporary instrument and shall be replaced once the Provincial Administration has updated the PLCP in conformity with Regional Law.

It provides reference and objective values for various aspects that are relevant for soil management such as reuse of built soil, permeability of urban soil, availability of green areas with trees, environmental connectivity, etc.. This gives municipalities clear indications on their development of conversion strategies.

For the detailed description see table 7.3 on page 37.

Building Regulation of the Municipality of Milan (Italy)

The updated version of the Building Regulation of the Municipality of Milan includes objectives of soil protection. It comprehends among its objectives explicitly preservation of permeability of soils and chemical and physical quality. It is the ultimate instrument to define which intervention can be permitted and which is not acceptable. Recently the authority started inserting articles into the regulation about energy efficiency to also rule incentives and taxes.

For the detailed description see table 7.5 on page 39.

Decree of determined amount of payment and specification of payment for agricultural land consumption (Slovak Republic, similar regulation also in Poland)

This relatively new "decree of determined amount of payment and specification of payment for agricultural land consumption" contains the quite innovative and strict regulation of payment for agricultural land consumption. The instrument is applying for all people who want to take agricultural land for non-agricultural purposes i.e. buildings, industrial, traffic, mining etc. Payment is obligatory for agricultural soil consumption (permanent or temporary) according to soil quality classes (first 4 classes from 9). The more fertile the soil to be used is the higher is the payment:

- 1st class: 15 EUR/m^2
- 2nd class: 12 EUR/m^2
- 3rd class: 9 EUR/m^2
- 4th class: 6 EUR/m^2

Responsible are the land offices acting under the Ministry for Land Management of Slovak Republic. For the detailed description see table 9.2 on page 52. A similar regulation exists in Poland – see table 8.2 on page 44. The law on agricultural and forest land protection t specifies that who causes degradation of land agricultural function must recover this function on own expense.

11.3 Requirements for soil protection

As all activities of the public administration have to be legally justified effective soil protection needs to be based on legally binding goals covering the different functions of soil (habitat function, filtering, buffering, storing functions and production function) as well as the different potential impacts (compaction, sealing, pollution, loss of organic matter, erosion). Concrete definitions of the objectives in sense of terms – such as sparingly, carefully and economically – would be helpful in many cases. Such a bundle of overall goals as e.g. set up in the Alpine Convention Protocol Soil Conservation is required for soil management by the public authorities.

The goals should be linked to thresholds that should be reached. These thresholds should take into account especially soil sealing and pollution. Furthermore the definition of different soil quality classes could contribute to a more differentiated treatment of soil and the protection of very valuable soil.

From the view of soil protection it is important to enhance the inclusion of soil protecting measures in the planning procedures. Thereby, the following issues are to be considered:

- The assessment of the impact of developments on soil should be assessed already in an early planning stadium in order to avoid any developments with serious negative effects on soil. The SEA could be one instrument to check the impact of planning decisions on soil. Thereby, standards for how to evaluate the impact on soil according to the different potential impacts (compaction, sealing, pollution, loss of organic matter, erosion) should be introduced to secure a certain quality of the assessment.

- The EIA assesses the impact of large scale projects (on soil). Technical standards and threshold concerning the impact on soil would improve the weight of chapter "soil" in an EIS compared to other chapters with already existing thresholds (e.g. noise or air).

- Smaller projects that do not require an EIA should be assessed regarding their impact on soil. Counterchecking soil protection objectives and measures in building permissions following clear technical assessment standards would facilitate this.

Beside the requirements in the planning procedures stricter monitoring procedures would increase the knowledge of the condition of soil and enable counter-measures, if goals are not reached or thresholds are exceeded. Especially, after the implementation of permitted interventions the public authority shall monitor, if the undertaken interventions differ from the permitted ones. In case of interventions that were not covered by the permission the authority has to decree rehabilitation measures or even penalties.

In any case of soil pollution or if actual developments does not correspond with the permissions the polluter-pays-principle should be used: The person that is responsible for the damage of soil should also pay for measures concerning its recovery.

11.4 Recommendations

Taking into account the high complexity of the different functions of soil (habitat function, filtering, buffering, storing functions and production function) as well as the different potential impacts (compaction, sealing, pollution, loss of organic matter, erosion) and the variety of existing instruments it becomes rather clear that there is not the one and only instrument for soil protection and soil management. A bundle of different measures is needed to meet all the different threats to soil and the different requirements to manage them in a way to protect the valuable functions of soil.

Based on the contribution of the experiences with the different approaches in the different regions of the project partners, the following combination of instruments seems to be useful:

1. **A comprehensive list of clearly defined legally binding goals for soil protection covering all aspects**:
   Common goals for all relevant regulations concerning the impact on and the protection of soil could help to develop a common understanding of soil protection throughout all

different sector related regulations. The goals should cover all types of potential impacts on soil such as compaction, sealing, pollution, loss of organic matter and erosion. The Protocol Soil Conservation of the Alpine Convention could be seen as a best practise example concerning the list of goals. Terms such as sparingly, carefully and economically etc. have to be clearly defined.

2. **Regulations on land consumption and sealing:**
   Land consumption and sealing threatens most of the soil functions. Various approaches can contribute to reduce land consumption:
   - Spatial planning regulations should focus on the development of compact settlements
   - Building decrees can limit the percentage of sealed surfaces of building land. This has to be assessed after finishing the development
   - Housing subsidies can be used to support the sparely use of land through higher subsidies for more densely buildings and support of renovation
   - Taxes on the use of agricultural land differentiated according to the quality of soil could guide the use of land to the less valuable areas
3. **Soil protection of non-urban land:**
   The use of non-urban land for agriculture or e.g. waste disposal can influence the quality of soil and erosion. Thus, regulations are needed to keep the quality of soil and to protect it against pollutants. This could be done by various approaches:
   - Thresholds on soil pollution e.g. concerning the use of fertilizers or pesticides
   - Subsidies for a soil-friendly agriculture using the existing system of subsidies for agricultural production
   - Taxes for agricultural land consumption
4. **Standards for impact assessments (SEA, EIA, land use permissions) to reduce the impact on soil when land use is changed:**
   During the procedure of impact assessments the effect of plans resp. projects and other land use changes on soil are assessed. In order to improve their quality standards, regulations on how the impact on soil has to be assessed best combined with thresholds could improve the effectiveness of these impact assessments.
5. **Effective Monitoring:**
   The use of thresholds to protect soil has to be combined with an efficient monitoring system. Only if it is possible to monitor the quality of soil, any instrument linked with thresholds can be used efficiently.
6. **Acceptance and awareness**
   What is considered as important in our society is dependent on the existing appreciation. Thus, the necessity of soil management and soil protection has to be in the focus of the relevant decision makers as well as of the relevant stakeholders. The awareness of the value of soil by the politicians that enact the laws is a key factor of the success of soil management measures.

URBAN SMS Soil Management Strategy

This paper belongs to the following section of URBAN SMS work plan:
WP3 Soil management concept / 3.1 Approaches and legislation / 3.1.2 SWOT analysis

www.urban-sms.eu

Contact details of project partner commissioning / responsible for this paper:

Sigbert Huber, DI; Centre for Soil & Land management; Umweltbundesamt GmbH; Spittelauer Lände 5; 1090 Wien; AT; sigbert.huber@umweltbundesamt.at

Other URBAN SMS Partners contributing to this paper:

Petra Blümlein, City of Stuttgart, Department for Environmental Protection, DE

Isabel Wieshofer, City of Vienna, Environmental Protection, AT

Marco Parolin, City of Milan, Executive Plans and Programs for Buildings Department- Office for Reclamation Plans, I

Franco Ajmone Marsan & Mattia Biasioli, University of Torino, Department of Valorization and Protection of Agroforestry Resources, Agricult. Chemistry, IT

Peter Medved, City of Celje, SI

Borut Vrscaj, Agricultural Institut of Slovenia, SI

Grzegorz Siebielec & Tomasz Stuczynski, Institute of Soil Science and Plant Cultivation, Pulawy, PL

Petra Vokurková, Czech University of Life Sciences Prague, CZ

Jaroslava Sobocká, Soil Science and Conservation Research Institute, Bratislava, SK

Siegmar Jaensch, District Authority Stuttgart, DE

This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF.