



# URBAN SMS Soil Management Strategy



## Review of existing soil compensation measures

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## 1. Introduction

The objective of this action is to review and classify compensatory instruments supporting soil protection. These instruments may involve financial measures used to compensate for the loss of most valuable soil resources in urbanization process or obligation to retrieve/improve soil functions in other areas. At this stage it is understood that compensatory measures may be of several types: legal requirements to undertake certain actions or management strategies, fiscal measures employing fees for loss of soil functions, voluntary measures, zoning regulations contributing to compensation of loss of soil functions. The data collected within 6.1.1 and put into a systematic matrix on compensation measures implemented in CENTRAL cities should enable identification of their efficiency in different regions. This output will be utilized in the 6.1.2 action.

## 2. Methodology

The information on compensation rules in the pilot cities were provided by the respective project partners. They delivered such information as:

- Tentative definition of compensatory measure
- Description of direct compensatory measures applied in the city (soil reuse, green area establishment, green roof establishment)
- Description of indirect compensatory measures (e.g. financial)
- Legal aspects of compensation (legal acts, compensation as planning requirements, environmental impact assessment, monitoring of compensation effectiveness)

## 3. Review of compensation measures in pilot cities

### Bratislava

In Bratislava regulations on protection measures, including compensation measures of agricultural land and forest consumption are precisely defined. Law on this topic mainly comes from national level, namely: Act 219/2008 which is a supplement of Act 220/2004, Regulation of Ministry of Land Management No. 508/2004, Decree of the Government of Slovak Republic No. 376/2008 and Act 24/2006 on EIA/SEA.

Act 24/2006 on EIA/SEA treats assessing of soil as a part of whole Environmental Impact Assessment as well as Strategic Environmental Assessment.

Act 219/2008 states that consumption of agricultural land, in general, has to be compensated by appropriate payment and specifies exceptions from this obligation.

These exceptions are:

- agricultural areas of size less than 1000 m<sup>2</sup> and in case they are in built up area – less than 500 m<sup>2</sup>,
- roads for accessing fields,
- high-ways and roads,
- buildings for state defence,
- individual housing less than 1 000 m<sup>2</sup>,
- buildings designed as “public beneficial”.

Exact amounts of money to be paid for consumption of agricultural land are defined by Decree No. 376/2008. They are dependent on a category of consumed land. Out of nine categories, top four are covered by the obligation. For each square meter of permanently consumed land, the fees are as following:

- 1<sup>st</sup> category – 15 EUR,
- 2<sup>nd</sup> category – 12 EUR,
- 3<sup>rd</sup> category – 9 EUR,
- 4<sup>th</sup> category – 6 EUR,

and are paid one-off.

In case of temporarily occupied land the fee is the same for each soil class and equals 1 EUR/m<sup>2</sup> per year.

Besides this indirect financial compensatory measure introduced by the Act and the Decree, there are also some direct measures in force in Bratislava.

One of them is topsoil excavation and reuse for reclamation. Regulation No. 508/2004 provides details on definition of soil levels, technologies of soil removal and stockpiling, as well as strict, technical information on reclamation process.

Another regulation of the ministry comprises consumption of forest and related land reclamation procedures that are described here with technical details.

Reuse of excavated top soil is problematic in Bratislava due to lack of lands requiring reclamation in the proximity.

Establishment of green areas and green roofs is also included in the national law. Regulation on urban planning and zoning No. 4/2007 – generally obligatory plan and zoning of capital of Slovakia Bratislava, concerns this subject. It includes recommendations for introduction of green zones to industrial, residential and recreation areas: newly constructed industrial plants should have 10% of green area, while newly built residential and recreational areas should have 20-30% of green areas. If such share of green areas cannot be obtained, there is a

possibility to partially compensate it by green roofs. The same regulation directly defines a measure for tree cutting (deforestation) as obligation to plant trees in other place. Measures for wetlands are not obvious but Ramsar convention is kept.

Compensation measures, both direct and financial are approved during planning phase by VUC (authority of District Land bureau). This institution also monitors and verifies employed measures.

## **Salzburg**

At national level of legal regulations, in Austria there is not any special act dealing with soil functions and their compensation. Act of Environmental Impact Assessment regulates the assessment of soil according to the other environmental media (water, air...) but it does not include detailed guidelines concerning soil issues in the planning process. “Good practice” and expert guidelines have been established in this matter, which contain compensatory measures to save or revive soil functions. This mainly comprises soil protection against erosion, contamination, compaction and groundwater protection. However consideration of compensation measures is different in different projects and those measures are not obligatory in the EIA. This reduces effectiveness of soil protection intentions contained in the EIA. For recultivation planners may follow the newly developed guideline - Recultivation Directive, which also aims at conservation and regeneration of soil functions. This directive provides a detailed guideline for different steps in recultivation for different sites (forest, agriculture): survey of current state, definition of site and recultivation requirements, technical implementation (soil construction), quality assessment and control, elimination of defects, documentation. Site conditions and the utility of the constructed site, particularly for sites with agricultural assignment, have to be assessed. Recultivation directive includes also a guideline for proper soil storage preserving soil properties and functions. Up to date this new instrument has not had real impact on protection of soil but it is expected to become the required standard in the future.

Another instrument which regulates soil recultivation on national level in some extent is the Federal Waste Management Plan. The instrument covers topsoil reuse in terms of its contamination (soil exceeding critical thresholds of pollution cannot be used freely but only in particular manner).

More precise regulations concerning soil and compensation measures can be found at local – regional level. This – amongst others – is founded in the fact that soil protection in Austria is

not regulated on national but on provincial level. The most soil specific regulation is the Soil Protection Law of Salzburg. It stipulates minimizing of soil degradation, conservation of soil functions, economic treatment of soil in spatial planning and also following good practice guidelines to assure soil productivity and fertility. Soil Protection Law of Salzburg regulates the use of soil amendments (e.g. sewage sludge), which can be used only in agreement with the above requirements. In this case the new Recultivation Directive is also an obligatory regulation.

According to the Nature Conservation Act Salzburg when certain project is approved by legal authority, this authority also defines environmental compensation measures which the applicant has to carry out. The ratio between impact and compensation is 1:1 in case the project is approved from the point of nature conservation. If the project does not meet all nature conservation criteria, the compensation must surpass the impact (ratio 1:1.3). If the compensation is not implemented it is replaced by adequate payment. In this case the fees feed the nature conservation fund which is used for compensation activities.

Within Nature Conservation Act, the compensation and impacts on ecosystem, landscape and recreation are assessed separately. The single issues are assessed using fixed scales and scores. Compensation measures related to establishment of green areas, i.e. afforestation and wetlands construction are commonly used, but their concrete implementation is decided case by case in accordance with local ecosystem, landscape and recreation conditions and requirements.

A regional agreement, based on the regional planning act is the - Regional Network Salzburg. It primarily deals with protection measures, however it contains some solutions which may also indirectly compensate soil functions lost due to urbanization process. Namely it stipulates implementation of green belts to save (ecological) valuable areas for recreation and agricultural production.

## **Vienna**

In Vienna regulations resulting from Austrian federal law are the same as in Salzburg. At local level minor differences occur between two cities in regulations concerning soil issues.

Viennese Nature Conservation Act gives the local authorities the possibility, but not obligation, to define compensation measures as conditions under which the project can be

approved. Directions given project developers comprise of recultivation, leaving at least 1.65m-deep soil layer in case of subterrestrial constructions under grasslands (if they are at least 300m<sup>2</sup>), constructing roads with surface permeable to water or prohibition of heavy vehicles use on soil surface to avoid soil compaction.

During planning process, according to Viennese Building plan, all city departments are allowed to give their remarks. The Department for Environmental Protection is a body designed to give recommendations on soil issues. These opinions are not fully obligatory, but if they are not applied the project applicant must provide a written explanation why they are not executed. Nevertheless up to 70 percent of soil protection recommendations were applied in the last years. Generally they are not direct compensation measures but some of them might have compensation effects. The recommended measures include:

- maximum percentage of sealing allowed for parking areas
- fixed green areas
- restrictive building lines
- leaving open spaces instead of housing
- modified structure position
- tree rows along streets
- topsoil construction with a depth of 1,65m at minimum over subterrestrial constructions like underground parking

## **Milan**

In Milan currently there are no official regulations defining and forcing urban soil compensation measures.

The definition of compensation measures originates from the “Natura 2000” network: compensation measures represent the most effective measure to counteract the negative effects of the given plan or project. Those measures aim to sustain site environmental functions, preserve habitats and species, thus it is fundamental to apply the measures before the plan or project causes irreversible consequences.

Despite lack of direct compensation regulation some compensation measures are put into practice. Generally in Milan compensation part of planning requirements is left to negotiation between developers, local administrative authorities and public control scientific institutions. Agreements between them are binding and has to be applied in practice.

Topsoil reuse, to some extent is governed by free market mechanisms, i.e. soil of good quality is object of trade. The mechanism is not fully effective – some amounts of surface soil are dumped in landfills. The only law regulation on this topic is Art 186 of Dlgs 152/2006-“Environmental Act”, which forbids to reuse polluted soils.

Concerning establishment of green areas there is no legal obligation to create them. But there is a mechanism at level of local authorities - municipal offices demand from private developers to create new green areas in exchange for building rights. Location of those new areas are subjects for the Dept. for Public Green and Equipment’s decision and to case-by-case negotiation. Consumed green areas should be recreated in the vicinity. Worth noticing is that the Dept. for Public Green and Equipment of Milan has decided that there is no possibility of financial compensation of consumption of green areas. .

Environmental Impact Assessment, introduced by Regional Land Planning Law (12/2005), is mandatory for urban development plans and projects. Exceptions are possible by an “exclusion procedure” which evaluates if there are conditions to apply full EIA or simplified evaluation is adequate. In both cases all environmental aspects has to be considered and mandatory compensation measures should be specified. Implementation of measures is monitored in the same way as duties within the urban development program. The developers do not get permissions to use, rent or sell the site or part of it without an official statement of fulfilment of duties by the Public Authorities and Control Bodies.

### **Stuttgart (Baden-Württemberg)**

Compensation of lost soil functions is covered by both national – federal law and regional regulations of the federal Land Baden-Württemberg. From national level comes Nature Protection Act implemented in 2002 and revised in 2008. It imposes on the initiator of an intervention to compensate it by compensatory or contingency measures. These two concepts are defined within the act as follows: compensatory means the recreation of functions, contingency means the substitution of functions in an equal manner. If the intervention is accomplished according to the building legislation then the decision about the compensation is subject to the building legislation.

Building Act from 2006 does not define exact types of compensation measures to be introduced and leaves them as a subject to consideration. A compensation payment is not provided.

At regional level there exists the analogue regulation to national Nature Protection Act. It has the same name, and stays in agreement to the latter one. Additionally it allows a compensation by payment if other compensation measures are not possible to be implemented.

Compensation Payment Ordinance is the regulation which specifies amount of money to be paid. The payment is assessed by area, in consideration of the impact of intervention (e.g. scale of sealing). The range of fees is 1.00 €/m<sup>2</sup> to 5.00 €/m<sup>2</sup>. The use of the fund is restricted to measures that improve, restore or protect functions of environmental media.

Details of application of direct measures are not regulated by any legal act, however two guideline documents exist in Baden-Württemberg. One of them refers to assessment of the soil performance. The second one deals with compensation measures – it provides a description of demands and valuation process. This latter guideline was published in 2006.

Most common direct compensation measure in Baden-Württemberg is reuse of topsoil. Additionally improvement of infiltration rate by extensivation of land use (e.g. transformation of arable land into grassland) is implemented, which generally is planned as compensation for flora and fauna, but also improves under certain conditions soil functions.

Compensation is a part of planning process - such record is included in the mentioned Building Act which also refers to Nature Protection Act. Besides these Acts exists the Environmental Impact Assessment Act (Gesetz über die Umweltverträglichkeitsprüfung (abbreviated as UVPG)). The goal of the act is to guarantee that in the case of certain projects, including zoning plans and land development plans, their impacts on the environment are comprehensively described and evaluated at an early stage. An environmental acceptability assessment has to include the ascertainment, description and evaluation of the direct and indirect impacts of a project on human population and environment with soils taken into account. According to this regulation, the initiator of a project (as e.g. municipalities with zoning or building plans) has to submit the comprehensive documents comprising the impacts on the environment to the competent authority. The documents must include at least e.g. a description of measures to minimize or compensate the impacts and a description of all components of the environment considering the general level of knowledge. Thus, in practice, an assessment of the impact on the environment, including the soil, and the compensation of the encroachment is required for nearly each project and planning.

According to Nature Protection Act of Baden-Württemberg the nature protection authorities keep a register of the compensation measures. The Ministry stipulates the details through an

ordinance. Because there is still no ordinance with detailed regulations, the register and monitoring in Baden Württemberg is carried out by the responsible authorities in a different manner.

## **Celje**

In Celje as in whole Slovenia there are no legal acts concerning direct or indirect measures compensating soil loss. In the past this field was better covered – consumption of agricultural land or green areas within city borders was connected with adequate payment. Currently, the topsoil (to 30 cm depth) of the area destined for buildings is usually collected and reused in a different location, even though it is not regulated by law. Impact assessments for soil loss due to construction works and monitoring of compensating activities are not regulated by legislation.

## **Wroclaw**

There exists a definition of natural compensation in polish law (the Law on Environmental Protection, 2001). Under this term are to be understood actions that include such measures as construction works, earth works, soil remediation, afforestation or creation of green clusters that lead to recovery of environmental balance in the area, compensation of damages in nature and preservation of the aesthetic value of landscape.

The same regulation contains the record that during construction work the investor must ensure protection of environment including preservation of soil, green areas and water retention. If it is not possible to fully protect the environment as is, it is required to compensate the damage through the above natural compensation actions. Environmental impact assessment, which may also include soil issues, is required for investments that may have a negative impact on the environment (decision of the authority). In such case the compensation measures has to be described in the investment plan submitted to the authorised authority. Implementation of the measures is verified at final acceptance protocol. Selection of compensation measures is project specific.

Direct measures involve the obligation to reuse the topsoil of the consumed agricultural land for improvement of land quality in the vicinity. This instrument is recorded in the Law on Agricultural and Forest Land Protection, 1995, Art. 14 and 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.

Similar record can be found in the Law on Excavation Wastes (2008) – the regulation contains the program of excavation waste management to minimize negative impacts of the extraction. A top layer of high quality soils must be returned to the same place after cease of excavation activity or, if not technically possible, used in other place for improvement of land quality.

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 (the Law on Agricultural and Forest Land Protection, 1995, Art. 7). The same 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. The Fund's budget is spent for protection of agricultural lands, soil remediation, improvement of land quality and productivity, construction of access roads or erosion prevention.

This financial measure was an important instrument indirectly compensating soil loss in urban areas. However last legal changes (2008) has abolished the fees for transformation of soils in urban zones.

#### **4. Summary**

There is a broad frame of compensation policies in the partner cities. Many of existing instruments are of voluntary character. It is proposed in further discussion on compensation measures, a following classification of tools is used:

##### **A. Direct measures:**

*A.1 Reuse of top soil excavated for of degraded land elsewhere*

*A.2. Establishment of green roofs*

*A.3. Establishment of green areas*

*A.4 Other direct measures to be specified by each partner – name the measure describe how it works and refer to any legal regulations if any.*

##### **B Indirect measures**

*B. 1. Financial*

*B.2. Any other indirect measures contributing to compensation of soil loss and indicate whether it is legally required (specify act) or voluntary action.*

In the light of review done, it seems to be desirable to open a wider discussion the need for more formalized compensation measures to mitigate impacts of urbanization on soil functions. It must be emphasized that future legal framework concerning compensation measures falls into subsidiary principle, however a set of common guidelines could be proposed. The information presented in this report would be used as a basis for developing guidelines which will enable planners and decision makers to choose the best option for compensatory measures tailored to given socioeconomic and environmental circumstances. Our analysis provide a clear evidence that compensation of soil function loss varies among Central Europe cities both in terms of legal regulations, assessment and practice. In some locations the compensation is ambiguous element of soil protection framework whereas in other locations (e.g. Stuttgart) it comprises well defined assessment procedures and set of compensation alternatives.

## 5. Summary table of compensation instruments in the pilot cities

		Bratislava	Salzburg	Vienna	Milan	Stuttgart	Celje	Wroclaw
<b>Direct measures</b>	<b>Reuse of excavated top soil</b>	Required by ministry law, details of reuse are provided	No legal requirement to reuse but there are guidelines with recommendation and details of excavation and reuse of topsoil.	No legal requirement to reuse but there are guidelines with recommendation and details of excavation and reuse of topsoil.	No legal requirement, topsoil reuse governed only by market	No strict legal requirement but it is very common measure proposed in process of project planning and acceptance	No legal requirement	Required by Parliament law. If soil not reused, fee is applied
	<b>Establishment of green areas</b>	Legal requirement for share of green areas in new industrial, residential and recreational zones. Requirement for planting trees to compensate deforestation.	No strict legal requirement. Green areas and wetland establishment are common measures but decided individually. Requirement for green belts.	No strict legal requirement. Might be required at planning and acceptance process	No strict legal requirement but developers are asked by municipality officers to create new green areas in exchange for building rights.	No strict legal requirement, subject to individual considerations	No legal requirement	No strict legal requirement. Might be required at planning and acceptance process
	<b>Establishment of green roofs</b>	Law allows green roofs as an equivalent for green areas if the latter is not possible.	Not regulated by law	No strict legal requirement. Might be required at planning and acceptance process	Not regulated by law	Not regulated by law, subject to individual considerations	Not regulated by law	Not regulated by law

<b>Indirect - financial measures</b>	Payment for soil consumption required by law. Fee depends on soil class	Legally imposed payment is required if direct compensation measures are not implemented.	No legal requirement	No legal requirement	Legal requirement required by regional law if other compensation methods are not possible. Fees strictly used for compensation of land loss	No current legal requirement. Historically, there was a payment measure for consumption of agricultural or green area	Fee if topsoil is not reused. Payment for consumption of agricultural soil within urban areas stopped in 2008. Still a requirement in rural areas.
<b>Compensation measures in EIA at planning phase</b>	EIA required. No specific assessment of soil functions. Soil is a component of broader environmental impact assessment	EIA required. No specific assessment of soil functions. Soil is a component of broader environmental impact assessment Good practice is used in EIA as a reference	EIA required. No specific assessment of soil functions. Soil is a component of broader environmental impact assessment	EIA required. No specific assessment of soil functions. Soil is a component of broader environmental impact assessment. EIA required, sometimes replaced by simplified procedure.	EIA required. No specific assessment of soil functions. Soil is a component of broader environmental impact assessment.	No strict requirements for EIA.	EIA might be required within application and plan acceptance phase for investments that might affect the environment (e.g. industrial). In such case no specific assessment of soil functions. Soil is a component of broader environmental impact assessment.
<b>Monitoring of compensation measures</b>	Monitoring of measures implementation by local authorities.	Obligation to implement measures stipulated during EIA. Way of implementation proof is a subject of negotiation with the authority	Monitoring through requirement for implementation notice. Random inspections by authorised authorities	Monitoring through requirement for getting statement of fulfilment from public authorities or control bodies	Monitoring is carried out by the responsible authorities in an individual manner	Not required	Monitoring of measures implementation through acceptance procedure by the authorised authority



# URBAN SMS Soil Management Strategy



This paper belongs to the following section of URBAN SMS work plan:  
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