

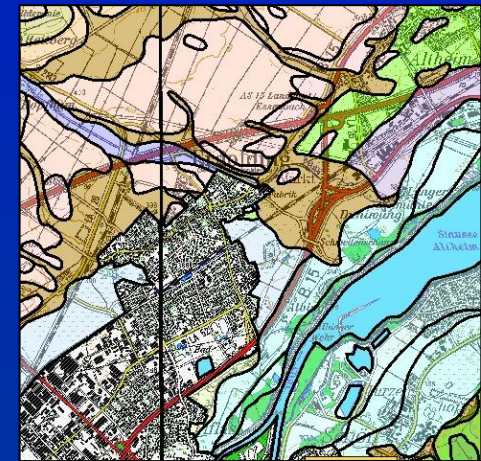


Technique of Urban Soil Evaluation in City Regions -
Implementation in Planning Procedures



TUSEC-IP

Technique Of Urban Soil Evaluation
in City Regions –
Implementation in Planning Procedures



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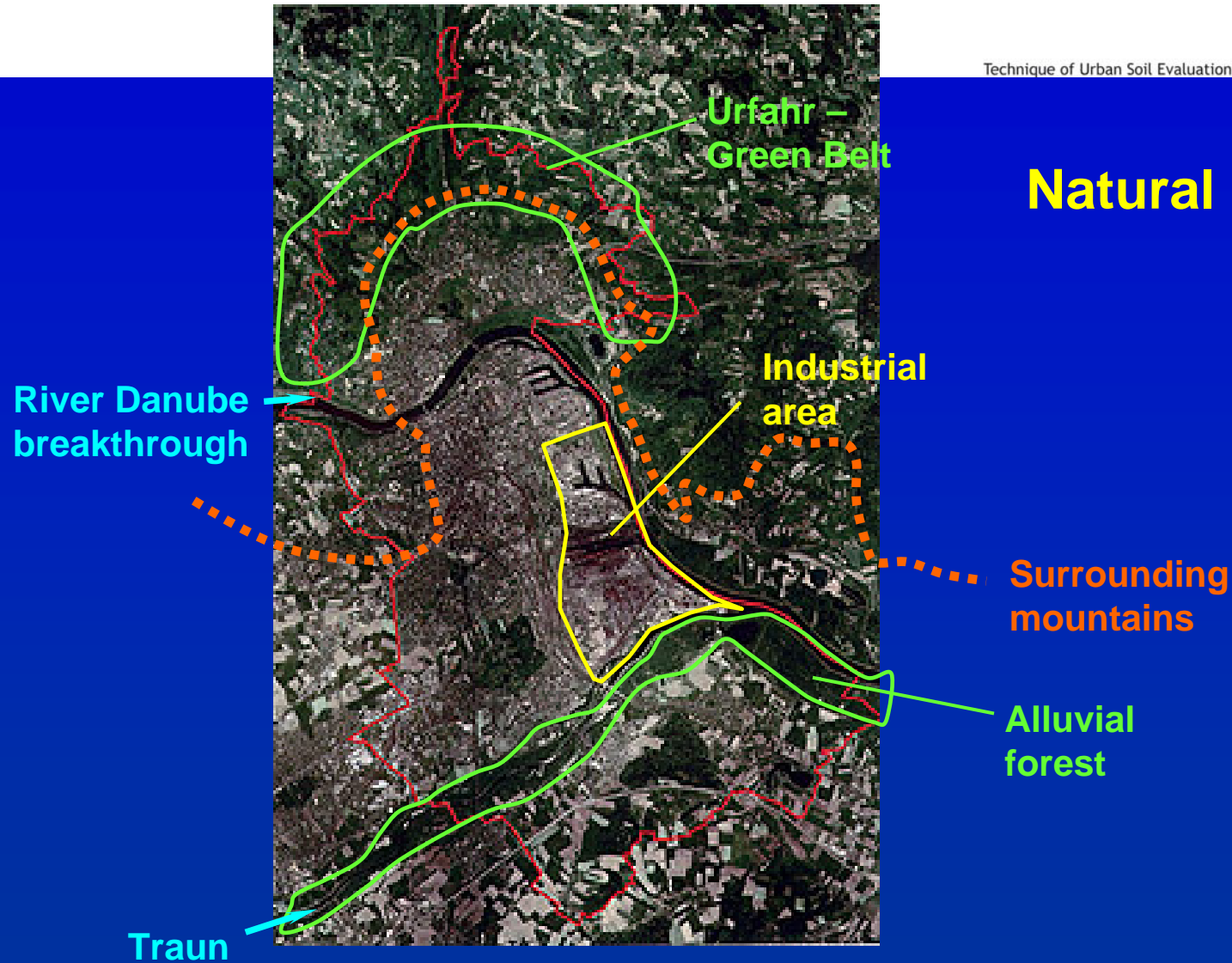
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Natural structure



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problems

In the north:

- bad connection to traffic
- high volume of traffic
- high portion of commuters
- strong pressure of settlement



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problems

downtown:

- high concentration of building land
- high volume of traffic
- low fraction of green areas
- little spare land for building purposes
- New utilizations and aggregations
- green areas are hard to be kept



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problems

south:

- larger reserves for building land (for residential purposes and companies)
- future extensions possible
- valuable areas for nature conservation

The price for building land in the central area of Linz (ratio price/benefits) leads to an increased migration to the surroundings

→ increased traffic

→ increased amount of commuters



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Problems

- Industrial emissions can make areas useless for future sensitive utilizations.
- Commercial (pre-)utilizations can have a direct influence on the possibility of posterior utilization of the area.



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Transnational space development INTERREG IIIB-Programme



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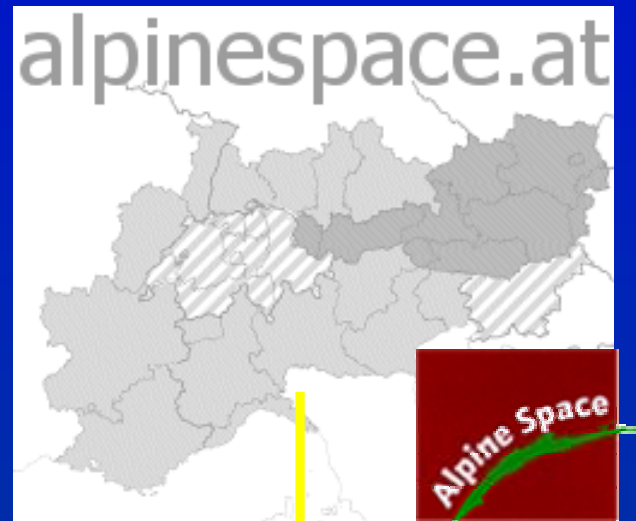
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Transnational space development INTERREG IIIB-Programme



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Munich

University of Hohenheim
experimental station
"Unterer Lindenhof"

**Dept. for Health
and Environment**

Municipality of Linz
Environmental and Technical Centre,
land planning

Federal Environmental



City of
Dept.
Plan
Envir
prote

City of
Grün

ruck
ute

University of Torino
Section Forest Protection and forest
improvement, Agricultural Chemistry

Autonomous Province of Bolzano
Agency for Environment and
working security



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Homepage

Awareness for soil in some countries

TUSEC – targets and consequences

Example Linz area



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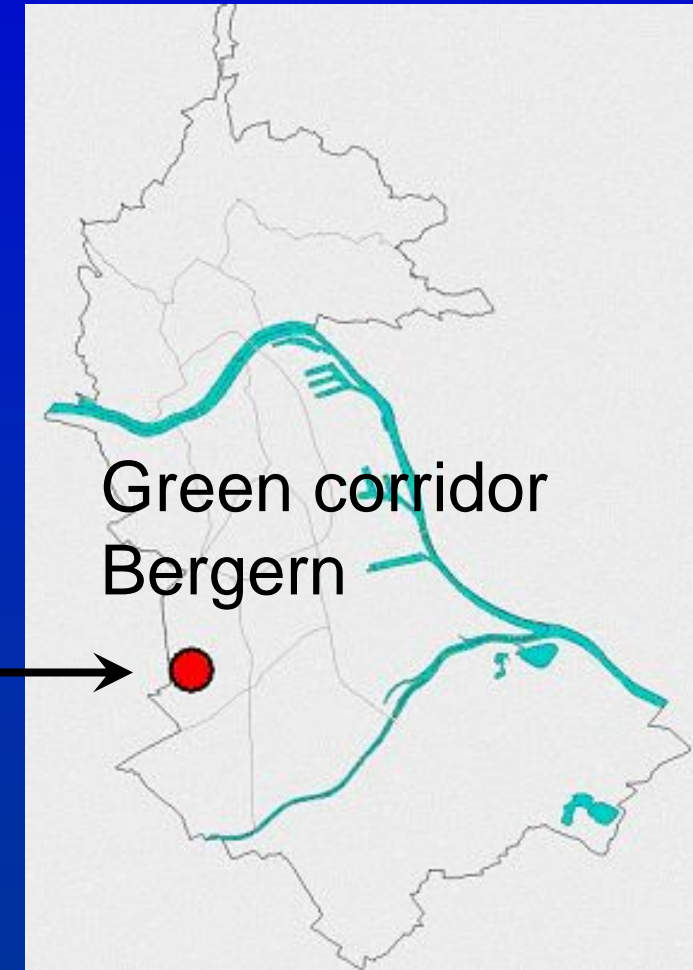
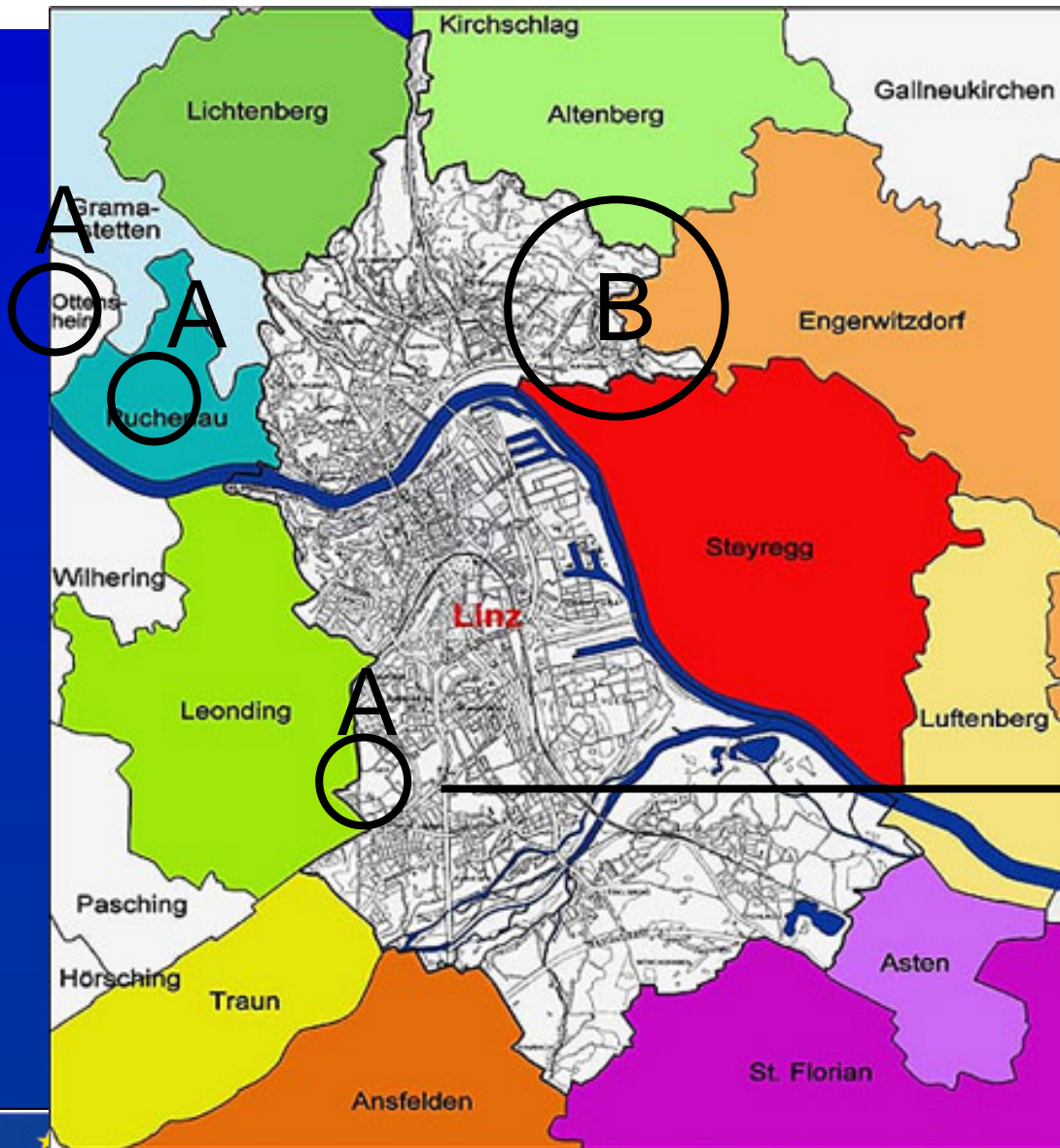


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- Horizon thickness
- Portion of anthropogenic intrusion (coal, bricks, etc.)
- Portion of organic substances (estimated, calculated or measured)
- Coarse material (artefacts >2mm)
- Carbonate content
- pH-value, measured or estimated from carbonate content



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- Influence of ground water
- Valuation of the redox-condition (e.g. rust stains)
- root content
- Density of the soil
- Dominating soil texture (kr – crumbs, subp – subpolyeders etc.)



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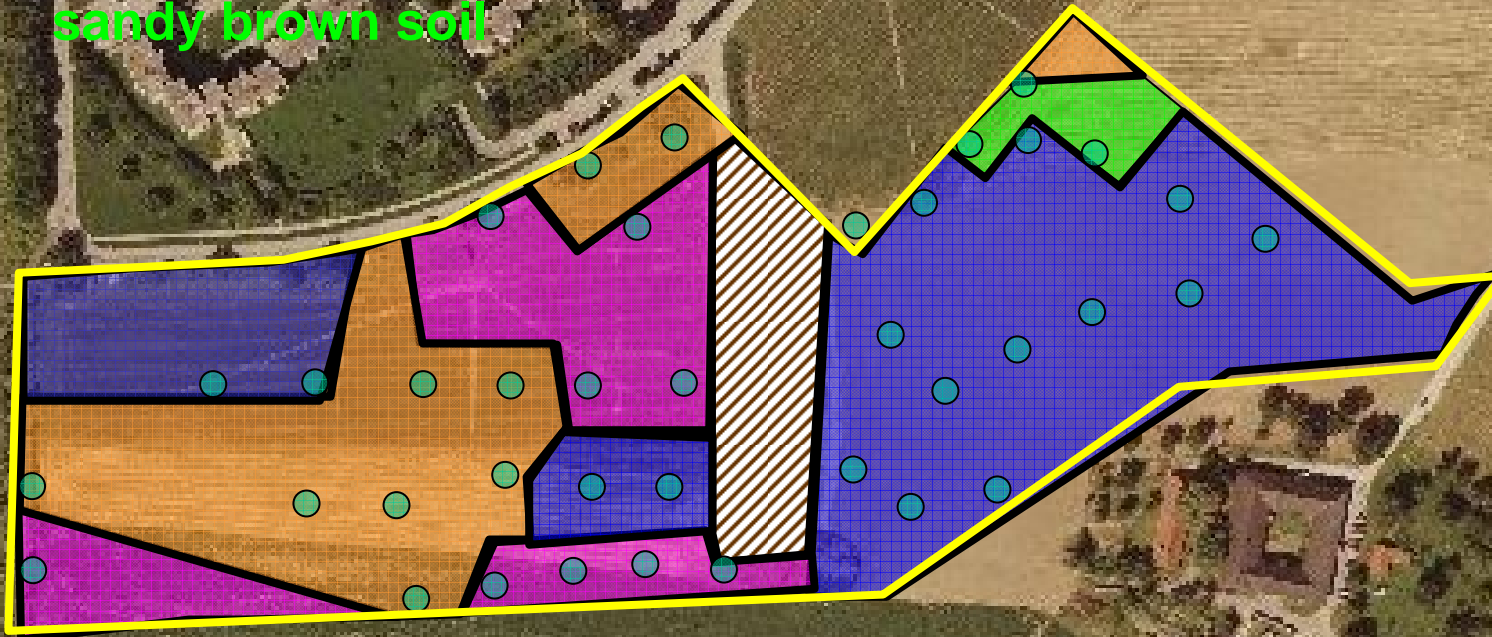


para brown soil, largely decalcified

brown soil, calcified

para brown soil, calified in the underground

sandy brown soil



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Evaluation tools

allocation soil function/importance/utilization (cut-out)

Soil function	evaluation	EMIT (Module U1)		NON-EMIT (Module U2)		LIVING1 (Module U3)		LIVING2 (Module U4)		TRAFFIC (Module U5)	
		Rel.		Rel.		Rel.		Rel.		Rel.	
Living space / Living base for Human beings (LIFE1)	1	<i>h</i>	-	<i>g</i>	+	<i>ko</i>	+	<i>ko</i>	+	<i>g</i>	-
	2	<i>h</i>	-	<i>g</i>	+	<i>ko</i>	0	<i>ko</i>	0	<i>g</i>	-
	3	<i>h</i>	-	<i>g</i>	+	<i>ko</i>	0	<i>ko</i>	0	<i>g</i>	-
	4	<i>h</i>	0	<i>g</i>	0	<i>ko</i>	-	<i>ko</i>	-	<i>g</i>	+
	5	<i>h</i>	+	<i>g</i>	0	<i>ko</i>	-	<i>ko</i>	-	<i>g</i>	+

.....



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Soil functions	Valuation	EMIT (Module U1)		NON-EMIT (Module U2)		LIVING1 (Module U3)		LIVING2 (Module U4)		TRAFFIC (Module U5)		AGRICULT (Module U6)		FORESTRY (Module U7)		SEPAR.GREEN (Module U8)		LEISURE (Module U9)	
		Rel.		Rel.		Rel.		Rel.		Rel.		Rel.		Rel.		Rel.		Rel.	
Living space / life base for human beings (LIFE1)	1	2	-1	1	1	5	1	5	1	1	-1	2	1	1	1	1	1	5	1
Living space / life base for animals and plants (LIFE2)	4	1	-1	1	0	1	0	2	1	2	0	2	-1	2	0	2	-1	2	-1
Function for water cycle (BAL1, BAL2)	2,5	5	-1	2	0	2	0	2	1	2	-1	2	1	2	1	2	1	2	1
Function for nutritive cycle (BAL3)	2	0	0	0	0	0	0	2	1	0	0	2	1	1	1	2	1	2	1
Filter and buffer for heavy metals (BUF1)	4	5	-1	0	0	0	0	0	0	5	-1	1	1	1	-1	2	-1	1	0
Transformer for org. pollutants (BUF2)	5	5	-1	0	0	0	0	0	0	5	-1	1	-1	1	-1	2	-1	1	-1
Archive function (ARC1, ARC2)	N	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Adequacy for natural agriculture (PROD1)	1	0	0	0	0	0	0	1	0	0	0	5	1	1	1	0	0	1	1
Function for flood protection (LEACH!)	1	2	-1	2	-1	2	-1	2	1	2	-1	2	1	2	1	2	1	2	1
Function for regulation of the micro climate (COOL)	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0
Pre-stress (1=very low; 5=very high)																			
Sealing	1	2	-1	2	-1	2	-1	2	0	2	-1	2	1	2	1	2	1	2	1
Agricult. erosion	5	1	1	1	1	1	1	1	1	1	0	2	-1	2	0	1	-1	1	-1
Brown field	N	2	0	1	1	1	0	1	0	1	0	1	1	1	1	0	0	1	1
Valuation for adequacy TOTAL			-20		0		3		15		-16		13		9		3		12
Valuation for adequacy ratio			-71,4%		0,0%		17,6%		71,4%		-66,7%		52,0%		47,4%		15,8%		52,2%
Adequacy TOTAL + / o / -			-		0		0		+		-		+		+		0		+



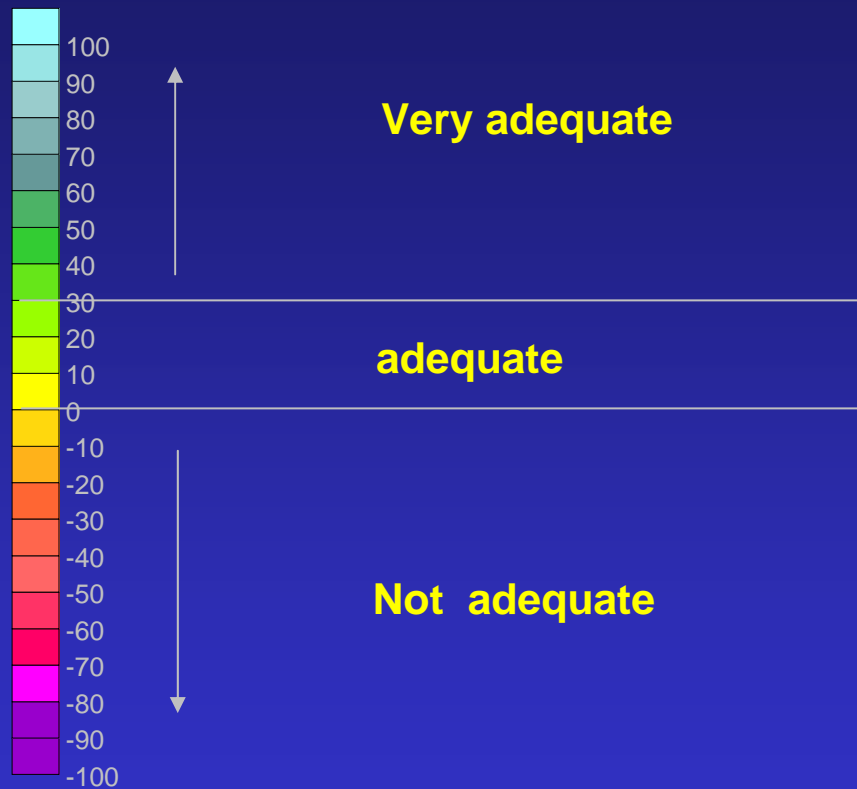
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Evaluation of 38 soil profiles



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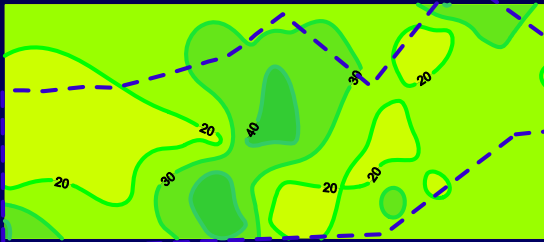
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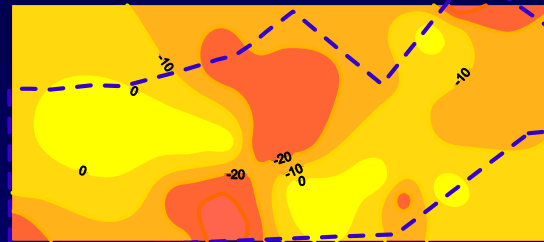
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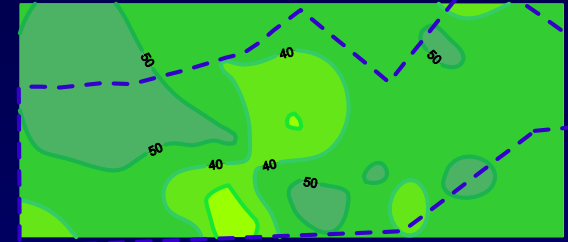
Living (1)



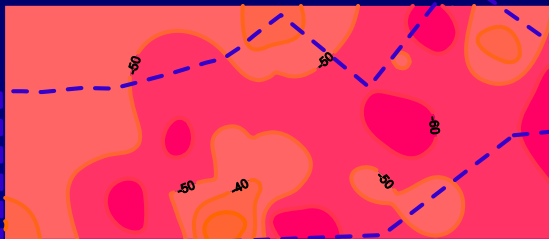
Value of protection



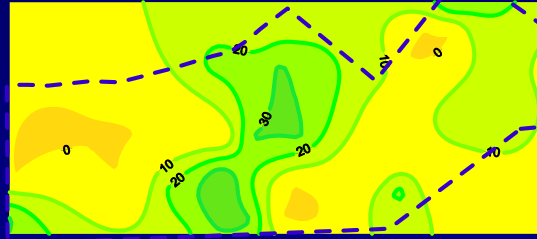
Leisure time



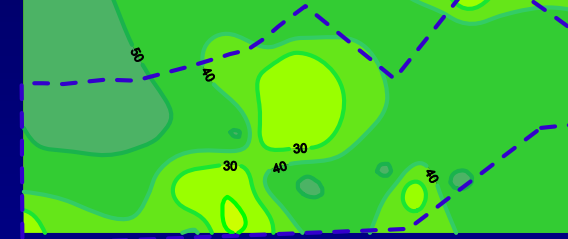
Traffic



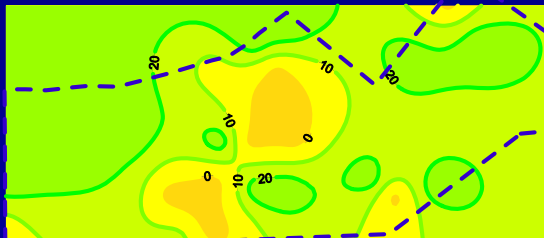
Non-emitting utilization



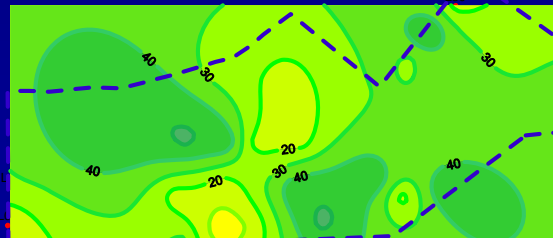
forestry



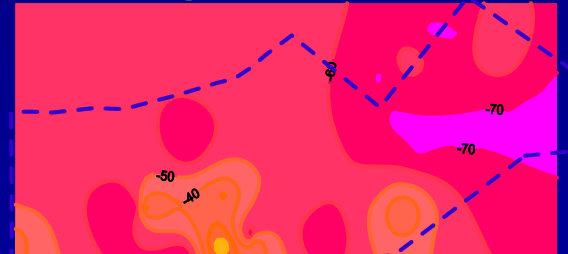
Separation green



agriculture



Emitting utilization

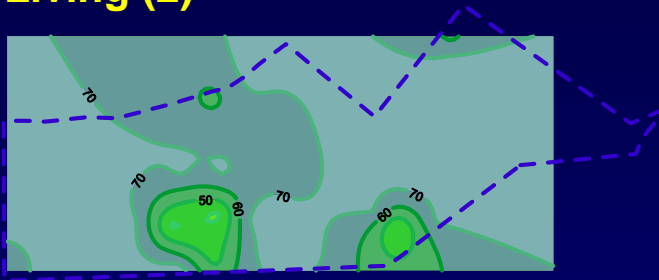


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Living (2)



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Soil provides a basis

- for climate balancing (Humus is an important storage for CO₂, the most important green house gas)
- for habitat for plantings (→ town climate)
- for storage of precipitation and a medium for purification
→ drinking water
- for a habitat of many, particularly not even investigated creatures.



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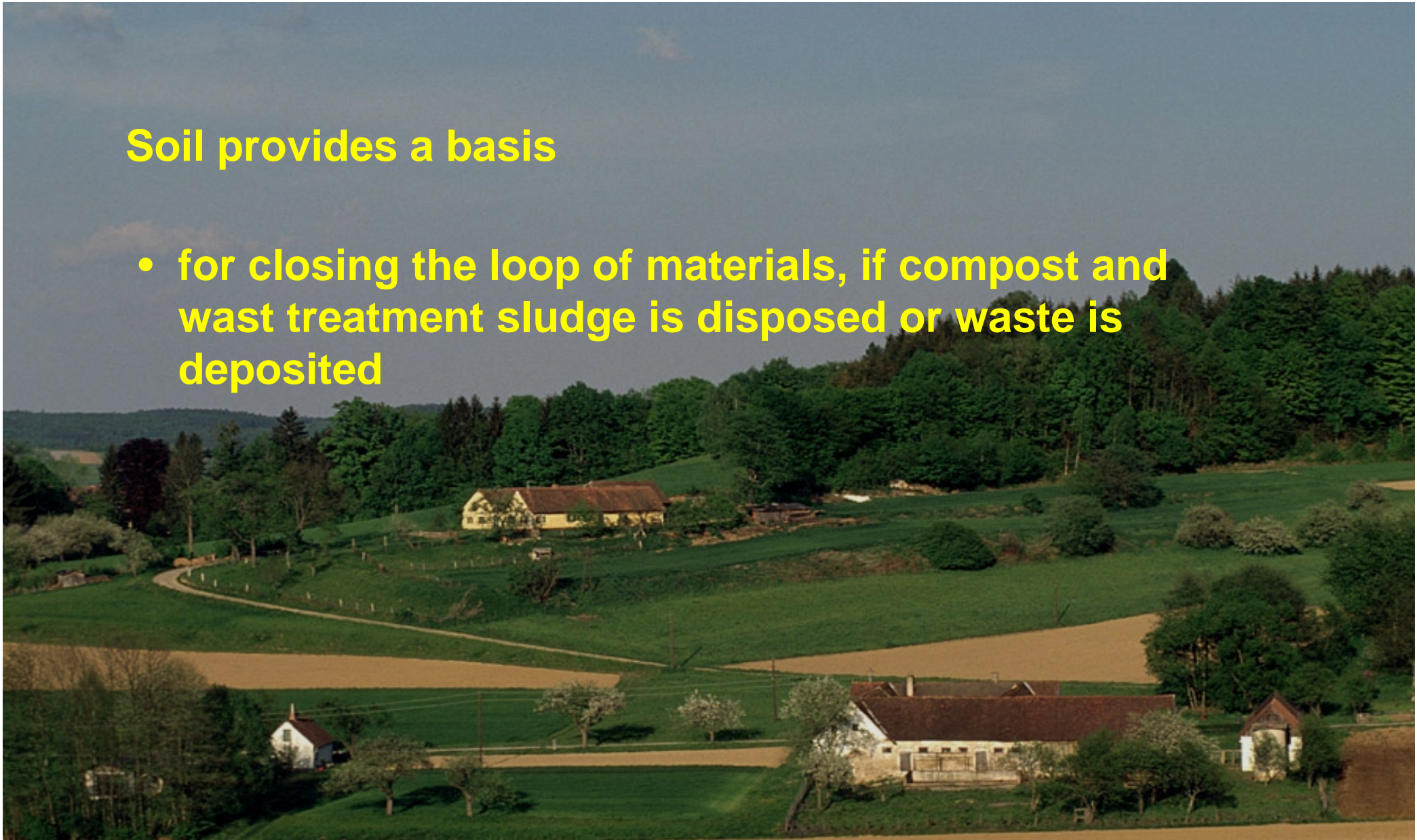
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Soil provides a basis

- for closing the loop of materials, if compost and waste treatment sludge is disposed or waste is deposited



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Linz Agenda 21

- also contains targets and measurements regarding soil

Indicators



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Sector Soil

Indicator

- suspicious areas: analysis of the number of suspicious areas per size class (< 100 m², 100-400 m², 400-700 m², 700-1000 m², > 1000 m²),
 - which have to be remediated
 - which have to be surveyed
 - where still no measurements have been set

Objective

- Reduction of the number of existing and prevention of new suspicious areas

measurement(s) for reaching the objective

- permanent soil surveys and control of the suspicious areas by the Federal Environmental Agency



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Sector Soil

Indicator

- present land utilization
- degree of soil sealing in the areas for building purposes and traffic

OBJECTIVE

- maintaining the portion of green areas in the town

Measures for reaching the objectives

- definition of sufficient amount of green areas within the areas for building building purposes (building plan!)
- Remove sealing and planting vegetation in courtyards



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Evaluation tools – calculation of soil parameters

ID	H_ID	H_BEZ	H_TIEFE	H_SAUM	H_TH	YZ/YK_%	Humus	HUMUS_ %	CR codiert	CR_ %	CARB_ %	pH	WATER	REDOX	ROOTS
L01	1	Ap	25		2,5	0	h3	3	0	0	c2	7,5		0 Vn0	W3
L01	2	AB	70		4,5	0	h1	0,5	0	0	c2	7,5		0 Vn0	W2
L01	3	B	100		3	0	h0	0	0	0	c1	7,5		0 Vn0	W0
L01	4				0										

density	BD	Gefüge	TEXTURE	Textur FAO	aFC	aFC_ges	AC	AC_ges	FE	CECpot	CECeff	CLY	pH_Kat	CLYF	HUF	kf
1	1,00	bro	Slu	L	26	65,0	15	37,5	2,5	19,5	48,8	20	1	0,5	0,8	40
3	1,40	sub	Slu	L	20	90,0	13	58,5	6,3	14	88,2	20	1	0,9	0,2	8
3	1,40	koh	Lu	SiL	23	69,0	5	15,0	4,2	12	50,4	15	1	0,5	0,0	13
	0,00					0,0		0,0	0,0		0,0		0	0,0	0,0	



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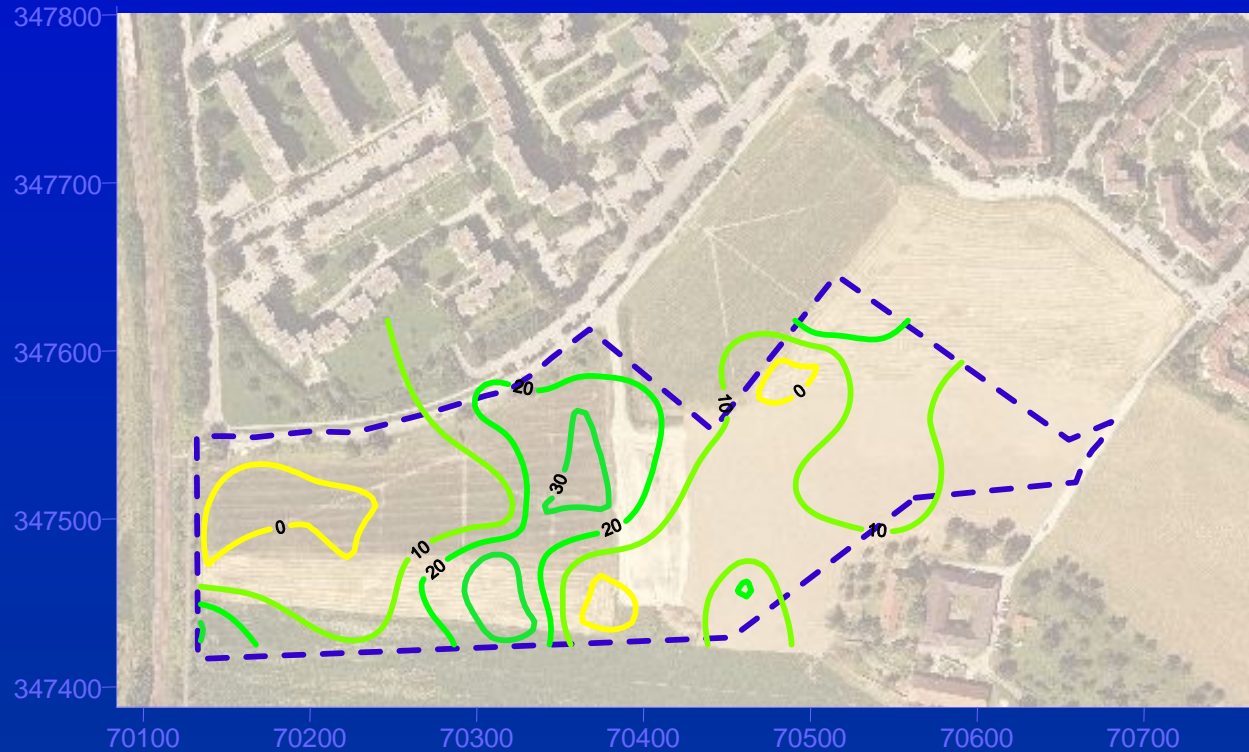
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Non-emitting utilization



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emitting utilization



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Traffic



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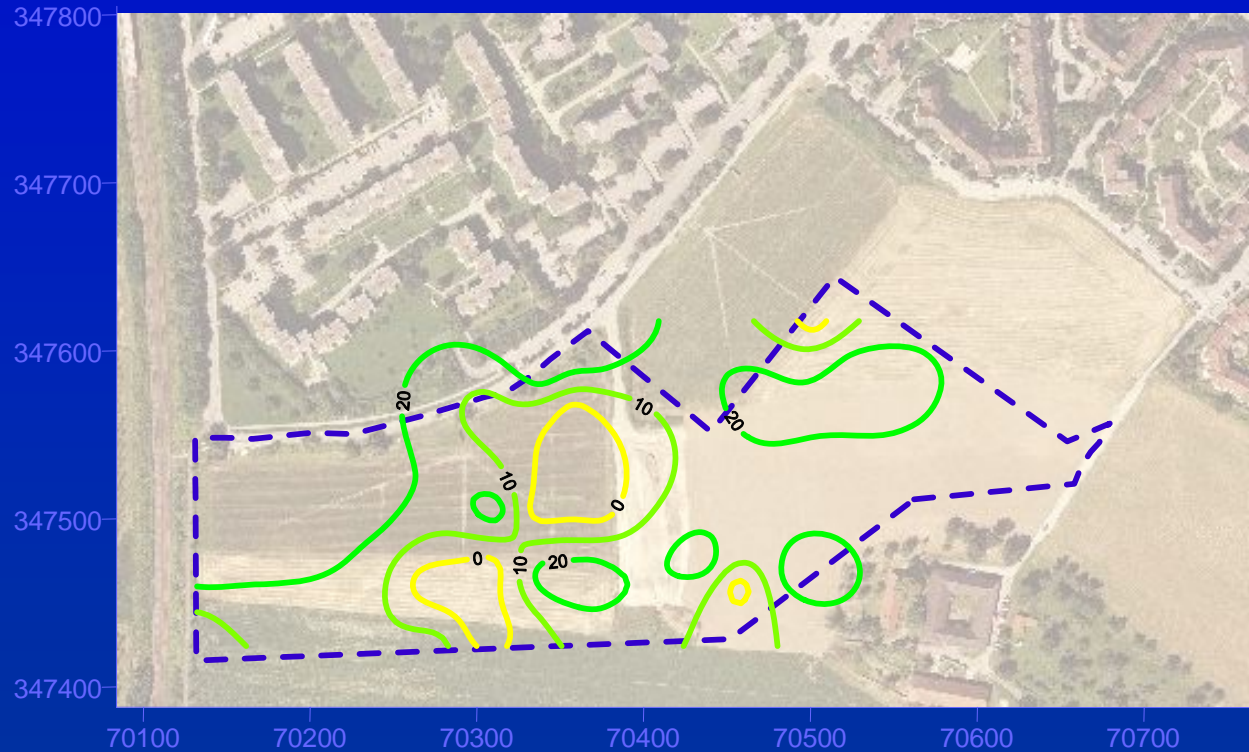
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Separation green



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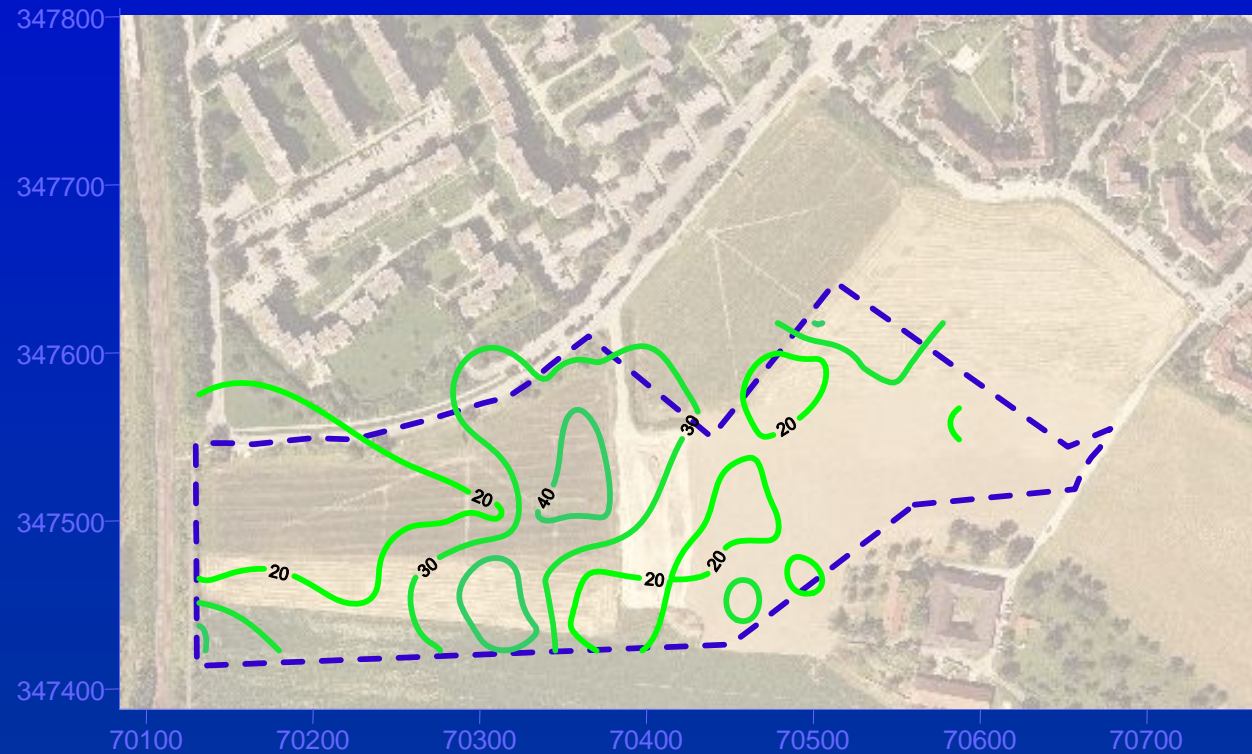
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Utilization for living puposes (1)



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Utilization for living puposes (2)



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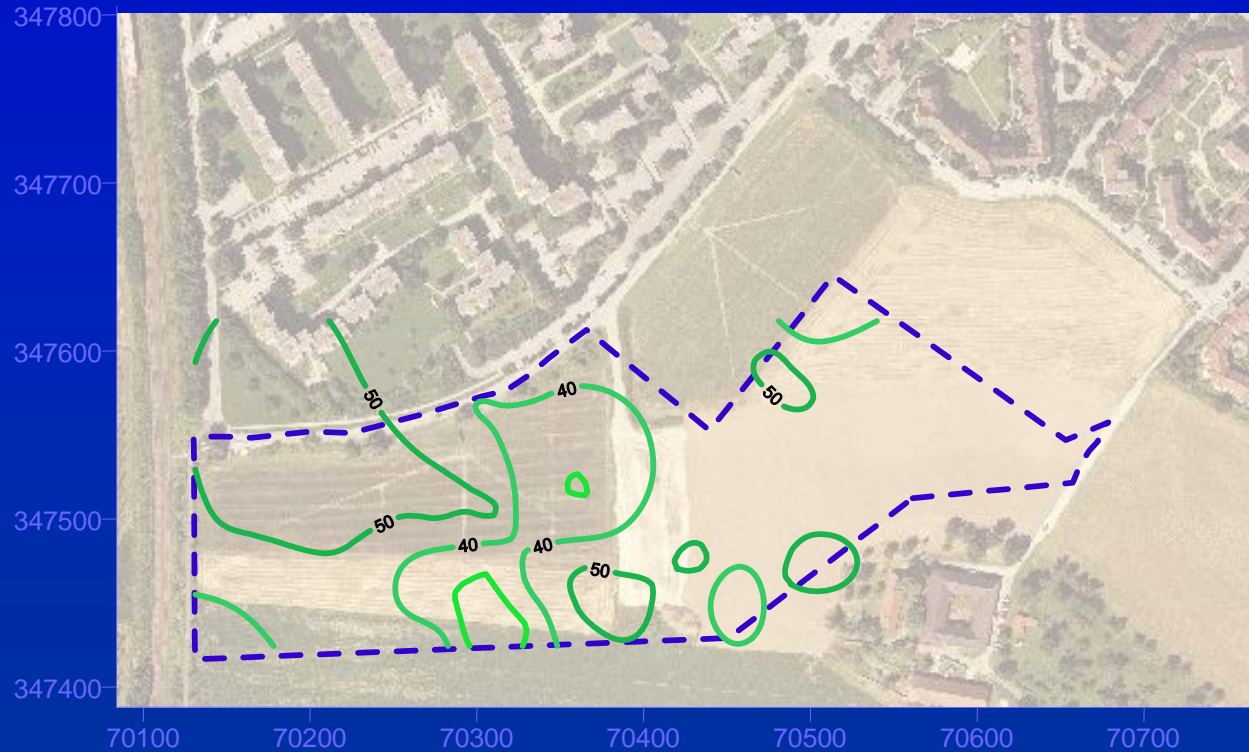
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Leisure time



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agriculture



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forestry



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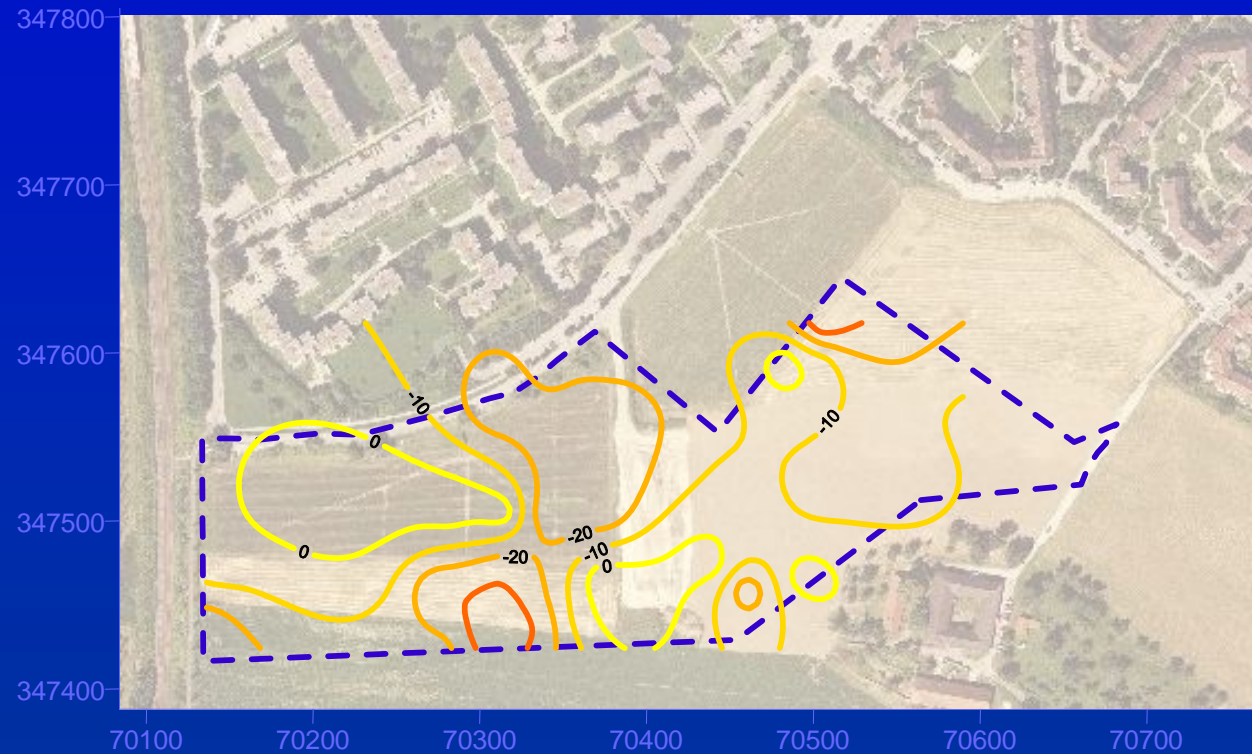
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Value of protection



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TUSEC- IP - Soils in City Regions - Microsoft Internet Explorer

Adresse <http://www.tusec-ip.org/>


Intranet | Home | Contact | Sitemap | Italiano | Deutsch

Technique of Urban Soil Evaluation in City Regions - Implementation in Planning Procedures


Project | Work packages | Partner | News | Best Practice | Links → Imprint

Soils in City Regions

Procedures and Strategies for a Sustainable Spatial Development



A Project for Interreg III B EU Community Initiative Alpine Space Programme



TUSEC-IP, developing projects...
TUSEC-IP is developing a procedure to evaluate soils in city regions of the Alpine Region working out strategies for its implementation in regional and municipal planning procedures. The procedure of soil evaluation should be simple, user-oriented, understandable and scientifically founded.


Top News
[TUSEC-IP Newsletter No. 1](#)
[Survey started in Austria, Germany, Italy, Switzerland and Slovenia.](#)

Press
["Kick-off" für TUSEC-IP in München \(published in "local land&soil news" Informationszeitung der European Land and Soil Alliance" no. 7/8/III/IV/03 \)](#)
[Article „Süddeutsche Zeitung“ – N° 213 from 16/09/03, page 42](#)

Work packages (WP)

- ▶ [WP 1: Project Management](#)
- ▶ [WP 2: Transnational Cooperation](#)
- ▶ [WP 3: Legislation](#)
- ▶ [WP 4: User Requirements](#)
- ▶ [WP 5: Soil Evaluation](#)
- ▶ [WP 6: Pilot Projects](#)

Partner



Best Practice

BauschuttBrowser
is a new service that offers to anyone who is interested a geographical indication of the areas where the use of recycled building material
[... more](#)

Events

[TUSEC-IP: time scheduling 2004 for projectpartner](#)
[23. 24. Sept. 2004 in Bolzano \(Italy\) Bodenbündnis - alleanza per il suolo-Soil &Land Alliance](#)

Internet



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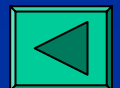




5

(6) Welche Informationen über die Böden ihrer Gemeinde sind für Entscheidungen in der Raumplanung von Interesse?

hohe Priorität - für Entscheidungen wichtig	mittlere Priorität - für Entscheidungen fallw. wichtig	geringe oder keine Priorität - für Entscheidungen nicht wichtig	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Eignung als Lebensraum für Tiere und Bodenorganismen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Eignung als Lebensraum für naturnahe Vegetation („Biotopfunktion“)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Eignung als Grundlage für landwirtschaftliche oder forstwirtschaftliche Nutzung („natürliche Bodenfruchtbarkeit“)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Seltenheit von Bodentypen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	natürlicher Zustand des Bodens / wenig menschlicher Einfluss
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Funktion des Bodens im Wasserkreislauf (Versickerungs- und Speicherleistung; Hochwasserschutz)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Grundwasserstand



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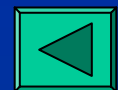
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Filter- und Pufferfunktion für anorganische Schadstoffe
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Filter-, Puffer- und Stoffumwandlungsfunktion für organische Schadstoffe
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	aktuelle Schadstoffbelastung im Boden
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Empfindlichkeit gegenüber Schadstoffeinträgen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Säurepufferfunktion
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Nitratrückhaltevermögen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dokumentation (prä)historischer Nutzungsformen (Archäologie)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dokumentation vergangener Vegetationsbedeckung (z.B. Moore)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bodenstabilität (bodenmechanische Eigenschaften)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Erosionsgefährdung
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Eignung als Rohstoffquelle (Lehm, Kies, Schotter; Torf)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verdichtung des Bodens
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ausmaß der Bodenversiegelung (auch: unterirdische Einbauten)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Eignung als Kohlenstoffspeicher (Klimaschutz durch CO ₂ -Bindung)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	sonstige (bitte benennen):



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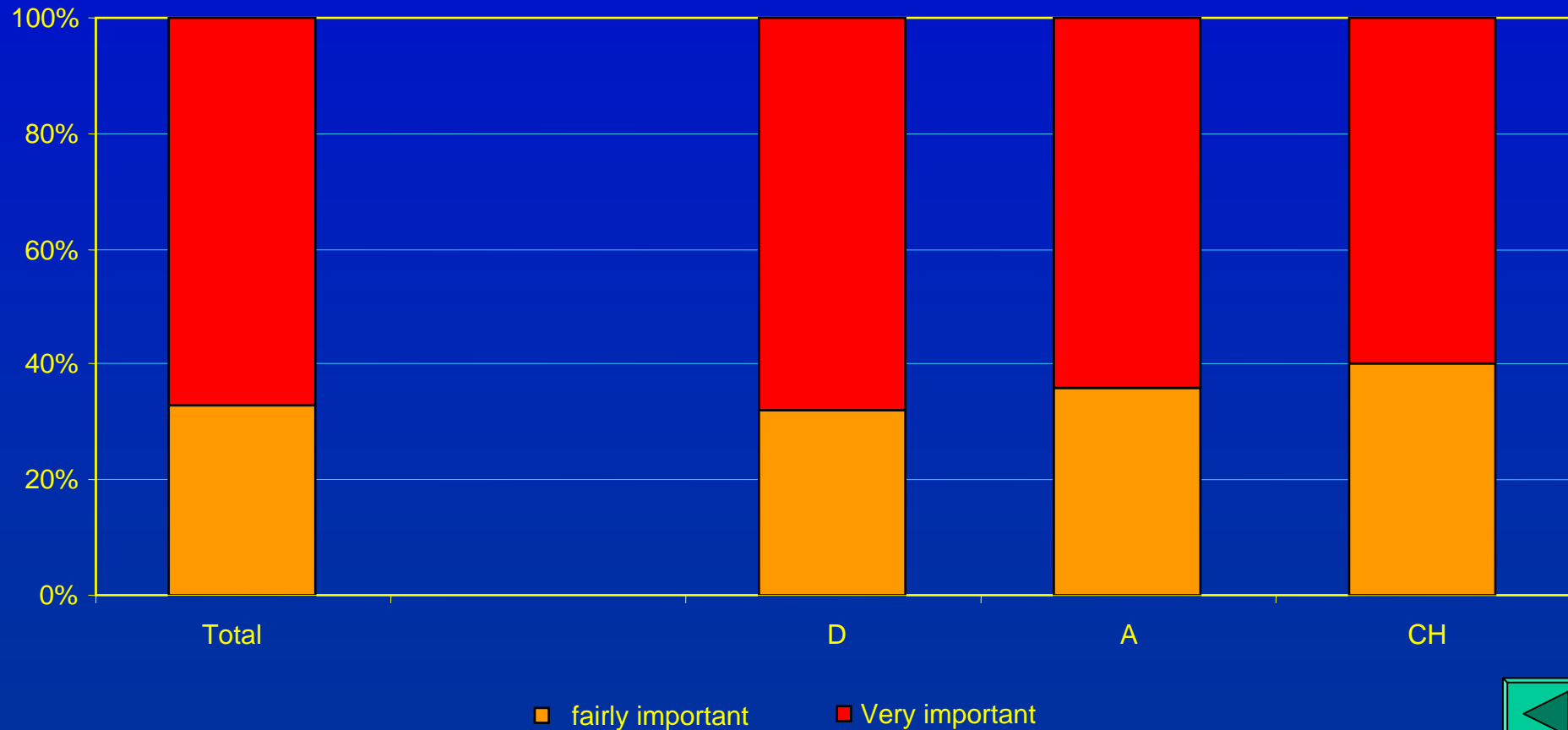
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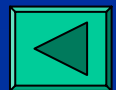
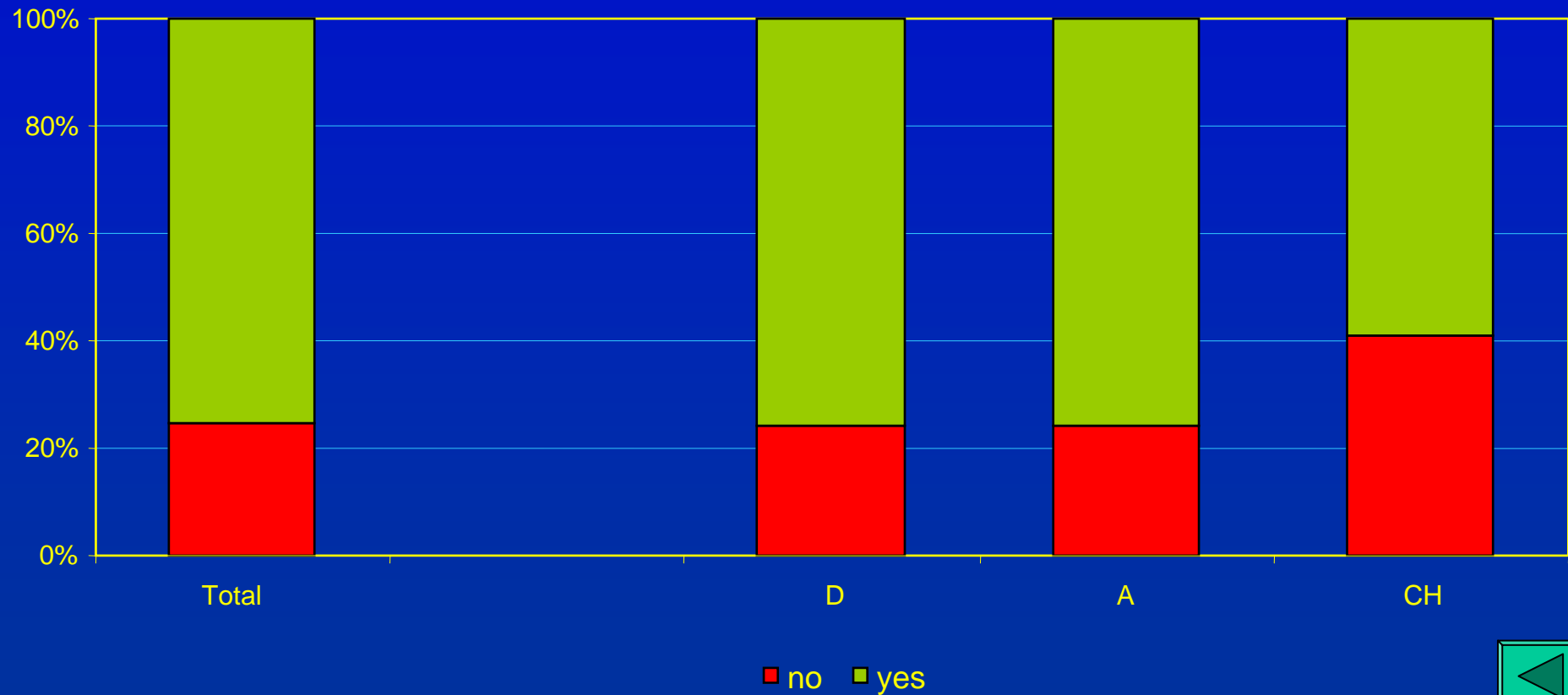
How important is it for you to consider soil a subject worth to be protected?



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Are aspects of soil protection enforcable in the local land planning?



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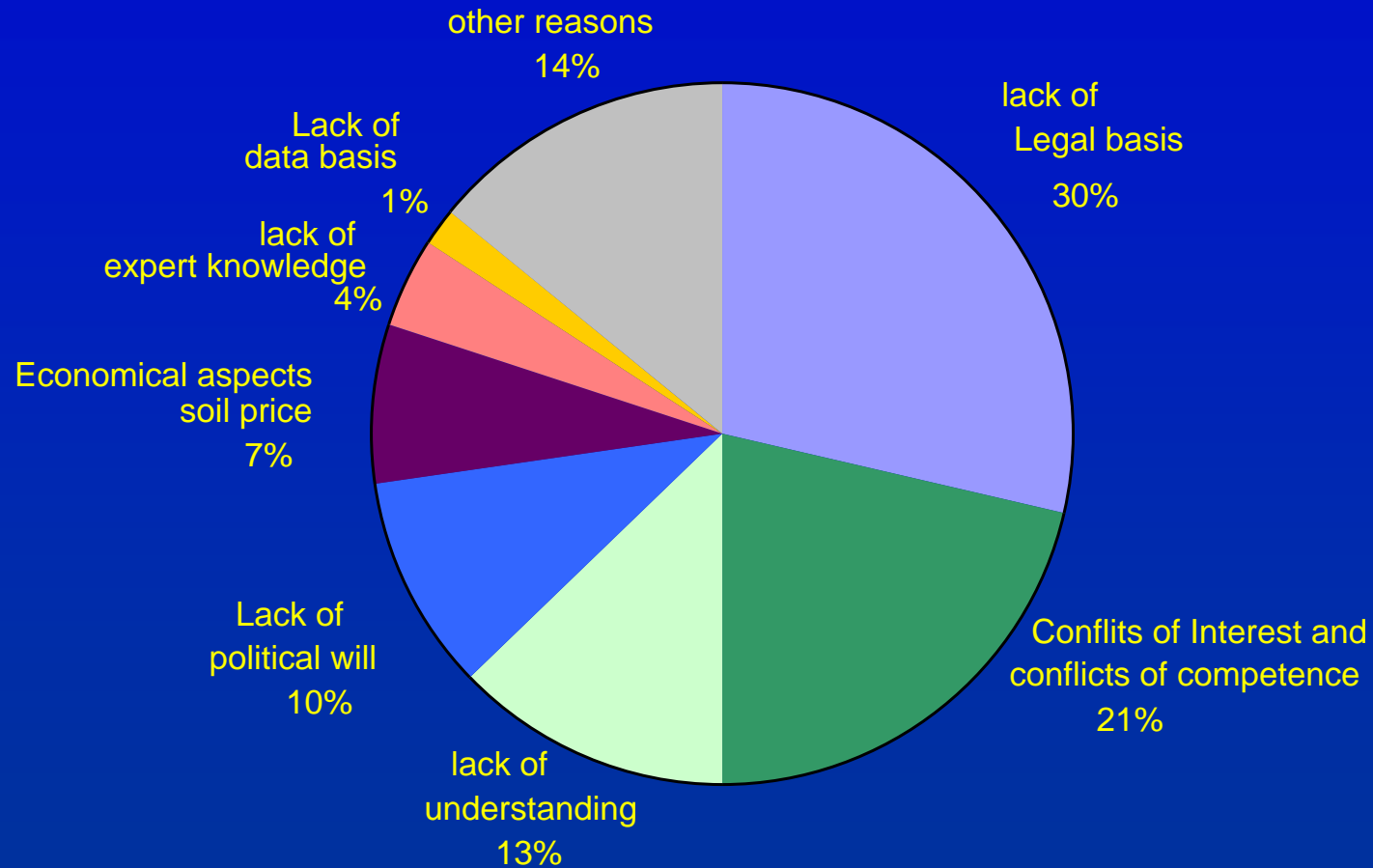
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Where are the difficulties for an enforcement?



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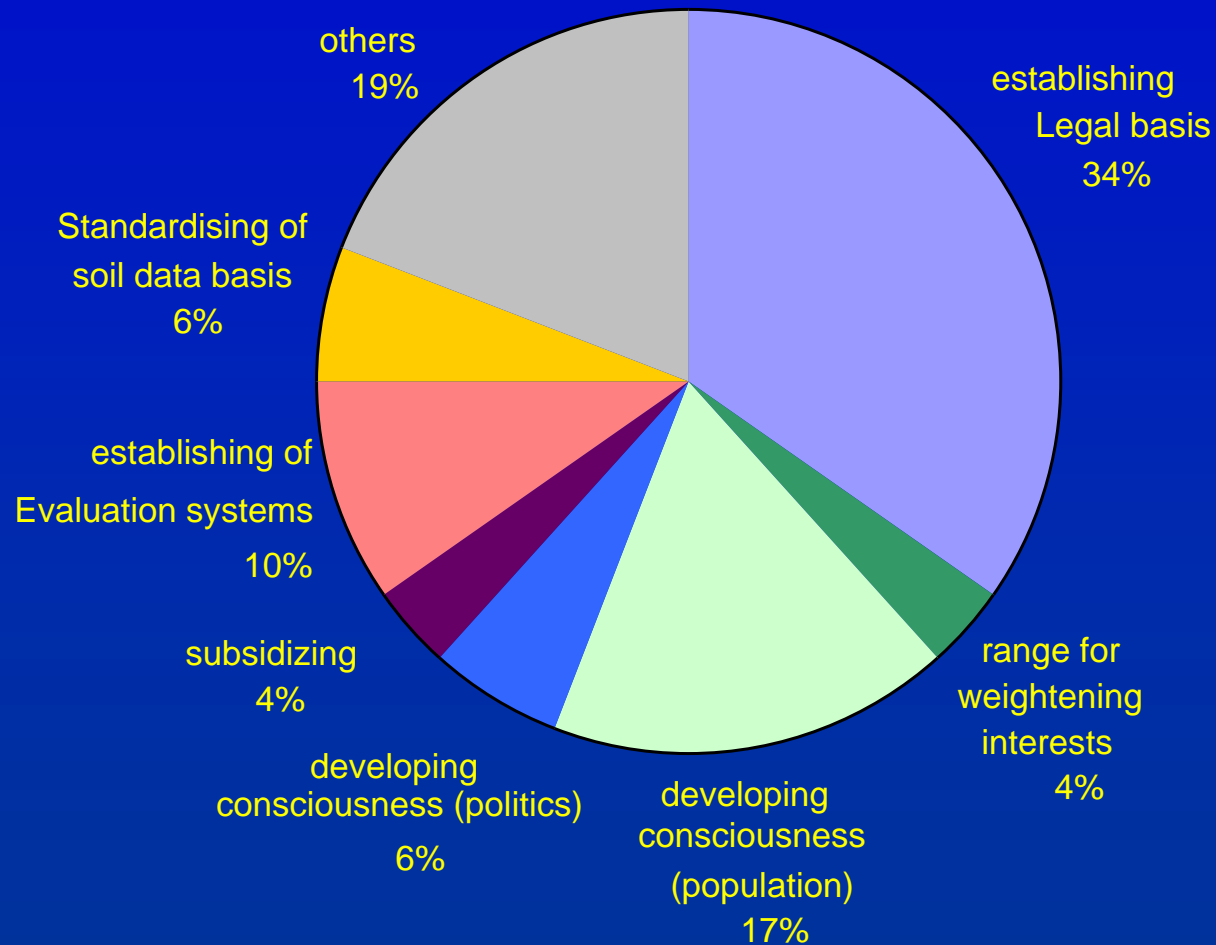
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Which improvements are to be aimed for?



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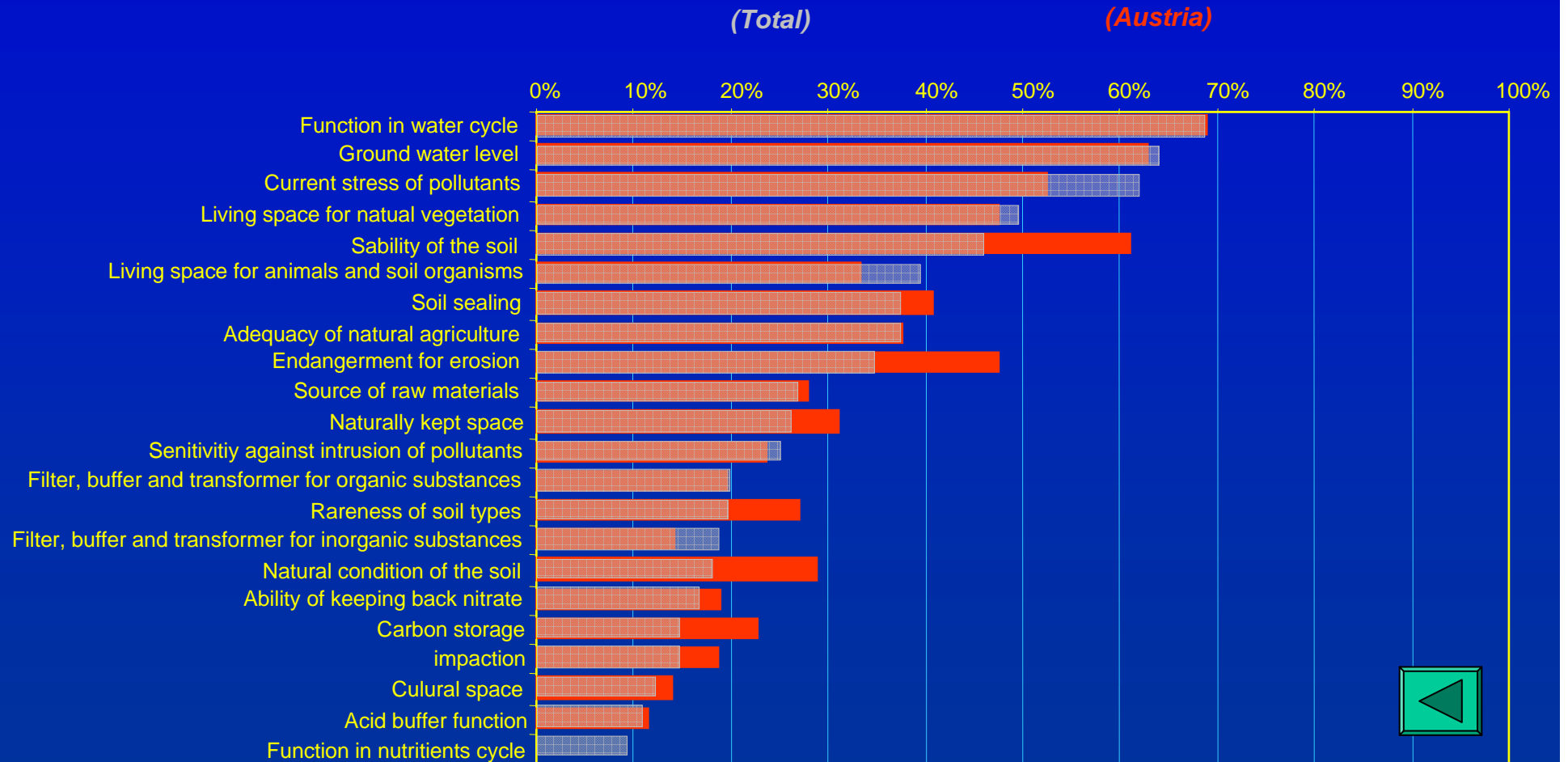
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What kind of information about soil is of interest for land planning decisions?



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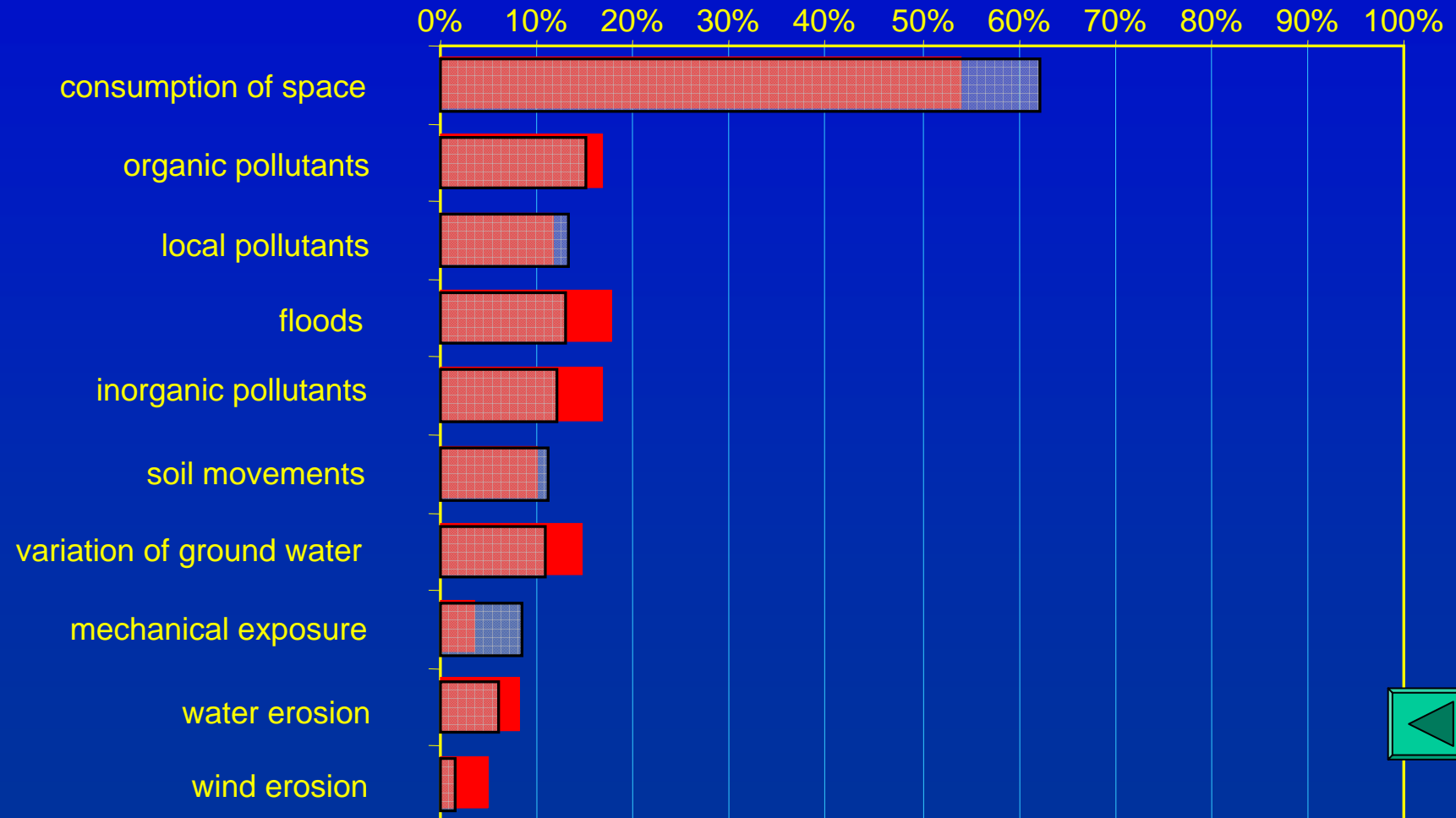
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The main stress for soils is caused strongly or very strongly or endangered by:
(Total) *(Austria)*



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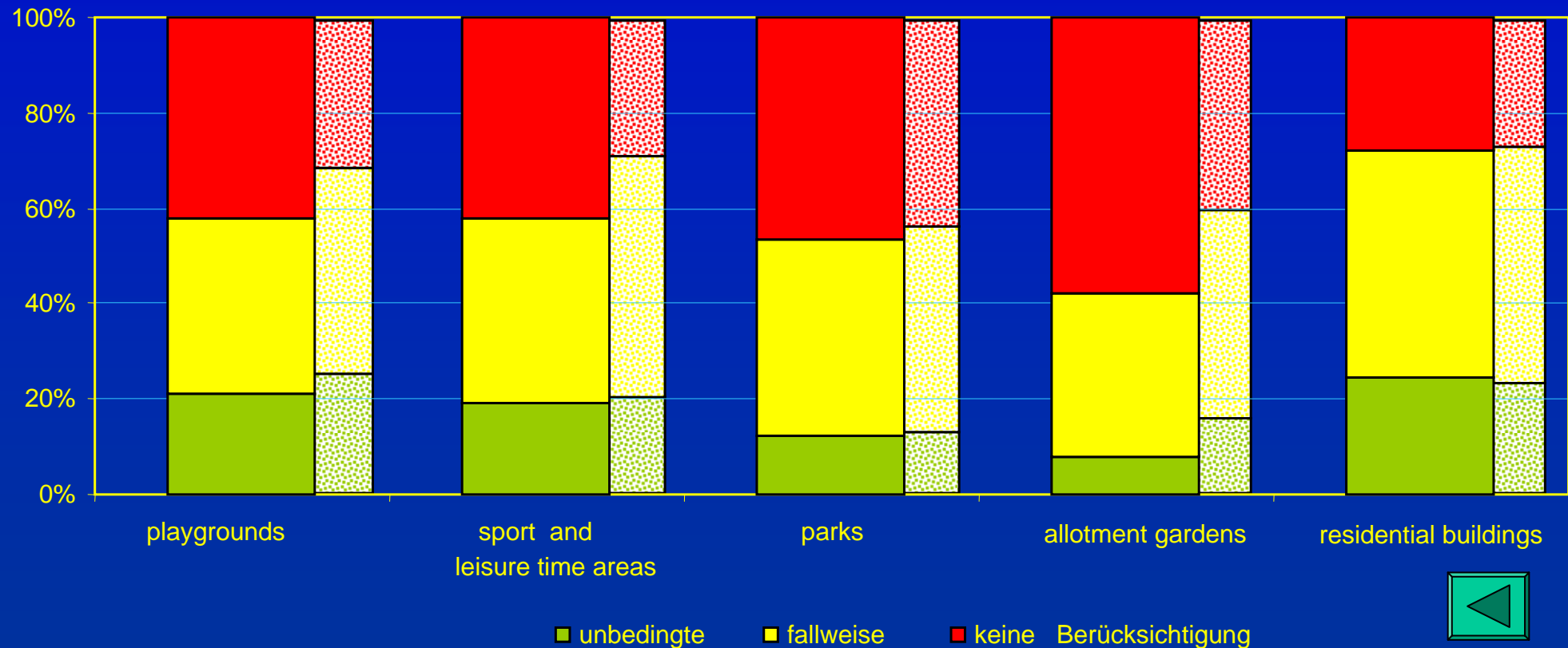


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For which kind of utilizations the adequacy of soil is considered in planning processes?

(Austria)



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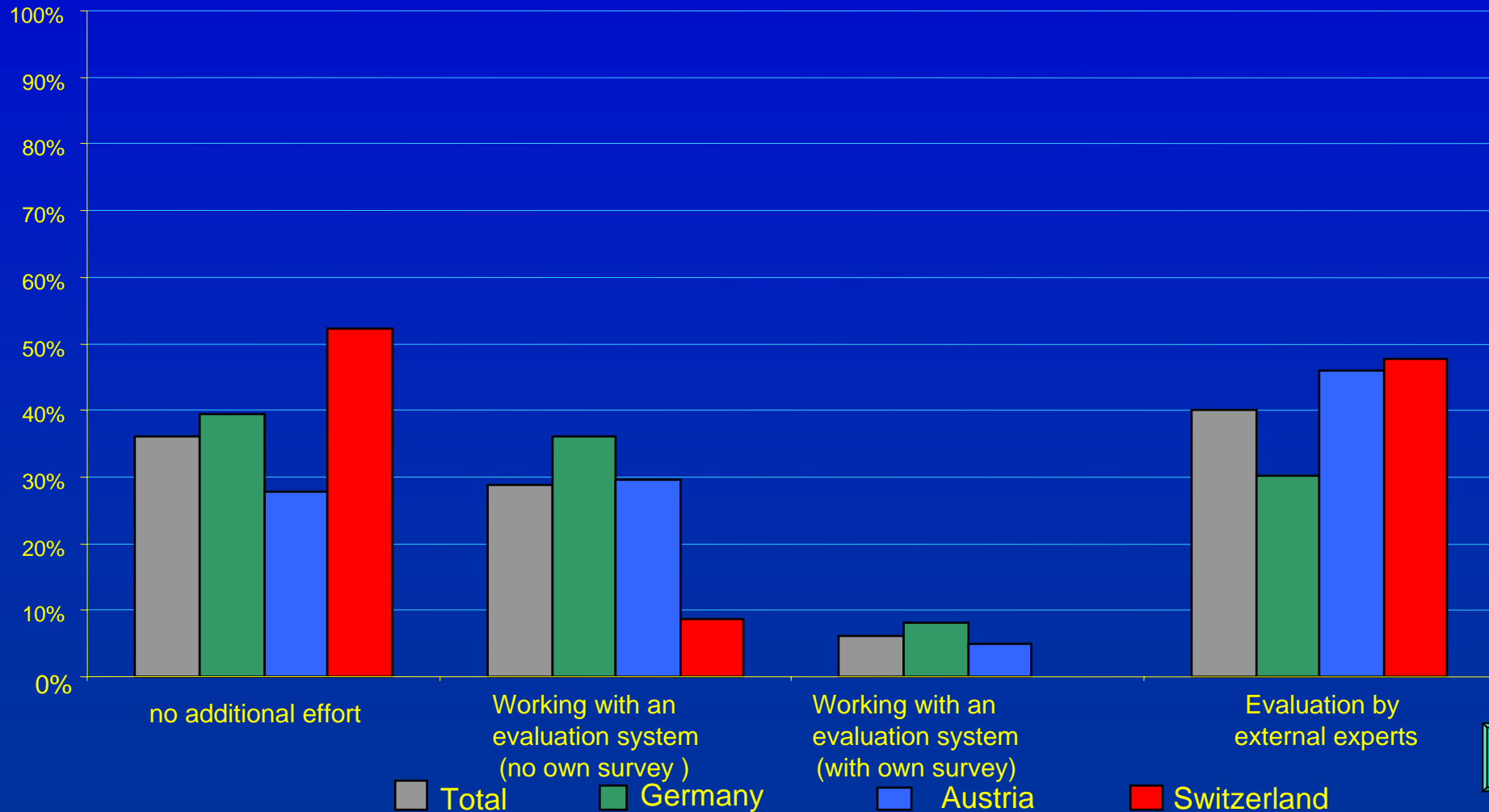
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Which amount of effort would be acceptable in terms of soil protection?



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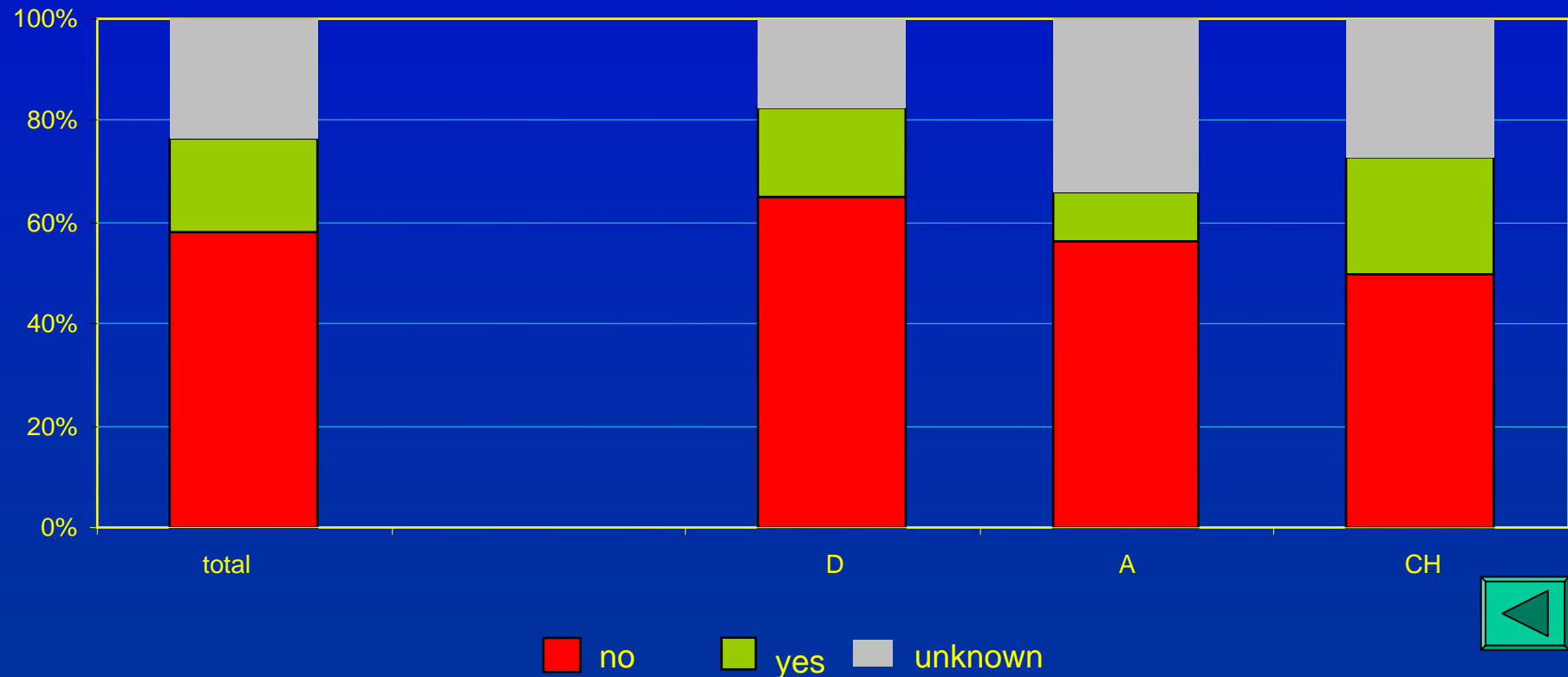
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Is there a person in your community who is able to carry out a soil survey by his own?



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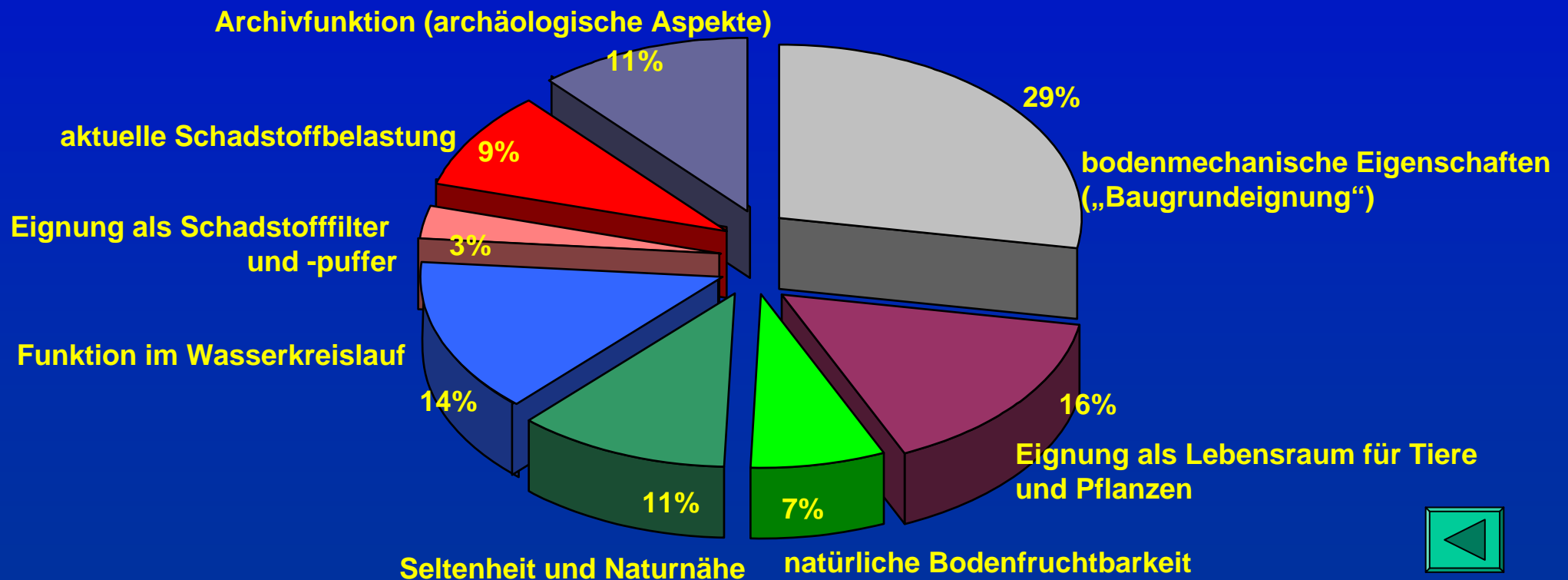
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Gründe für Bodenschutz und Raumplanung in Österreich

(auf 36 Fragebögen beantwortet)



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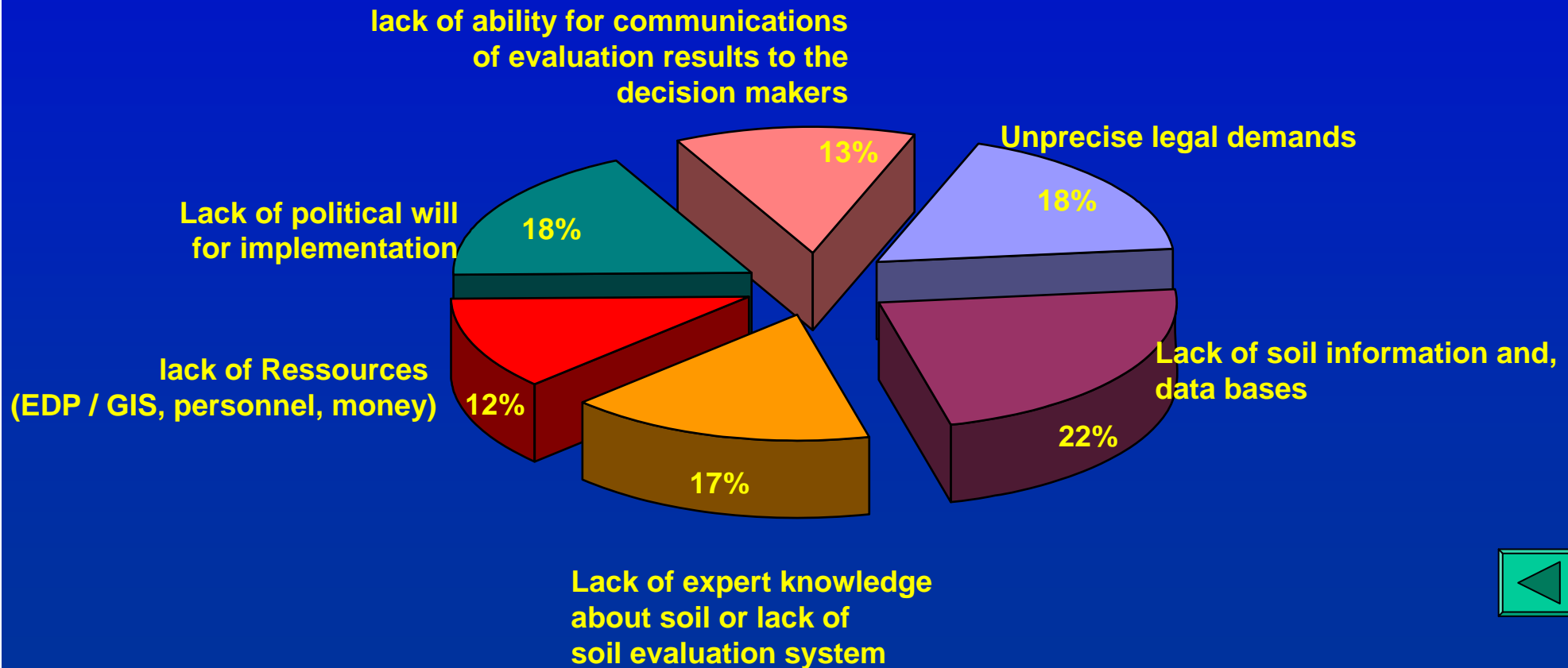


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Where lay the deficiencies regarding soil protection in land planning?

(31 questionnaires answered)



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Objectives for the project

- Process for the Valuation of soil function and soil degradation
- Guideline for the applicability of the soil evaluation system as a planning instrument for various planning processes
- Pilot project, where the new procedure is applied in planning processes



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Objectives for the project

- catalogue with implementation strategies
- Internet platform, folders, brochures and reports
- conferences for applicants and experts
- final report with summarized project evaluation



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Expected effects

- Reduction of the soil and space consumption and the soil pollution
- Raising of the significance of soil protection when acting in communities
- subsidizing of an exchange of knowledge across country borders



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Expected effects

- harmonization of the dealing with soil in the communities in Alpine space for realizing a balanced and sustainable development of land usage
- Subsidizing of a sustainable development of economy and trade in Alpine space



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