New aspects of the land conservation and land use legalisation in Slovakia

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Motto:

“The the soil is not regarded as a complex of restricted numbers of properties but as an entity. The existence of a natural order (based on causality) is the objective test of our work in soil systematic that shows whether we have succeeded or failed.

Kubiena (1958)

Introduction

The present land conservation and land use modelling level in Slovakia results from the gradual knowledge evolution: "**From soil survey and land evaluation to the sustainable land resources exploitation".** Particular attention is paid to the quantification of sustainable farming system parameters in different "***pedoecological***" conditions.

These activity trends could be characterized also as the effort to understand harmonized relation *between the land capability potentials and human demands in new socio-economic conditions.* It means, that our goals are in the consistently argumentation, that **the soil properties are one of the very significant land components not only for the soil, but also for all land use components conservation.**

The specific aims of land use efficiency modelling are expressed in the synthesis of both the ecological and economic assessment of soil and land productivity potential. The set of presented models and maps including economic efficiency calculation enables to apply new concepts of the sustainable land use planning in wider rate as well as in soil and landscape conservation, but also for the new relevant aspects of the new relevant **land conservation and land use legalisation.**

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Key words: Sustainable land use and land conservation modelling; Soil and land productivity evaluation, Pedoecological Units System; Typological productivity categorization and land conservation legislation.

1. Pedoecological Units System in Slovakia

Pedoecological Units System in Slovakia (PEU) is defined as a complex of **relatively homogenous land units, which have been mapped on the basis of soil properties, climate and relief evaluation and having their own production potentials.**

The Basic PEUs express combination of:

- **11 agroclimatic regions (T), 37 soil sub-types (P),**
- **19 parent material groups (G), 5 soil textural categories (Z),**
- **7 sloping categories (S), 4 gravel content categories (K),**
- **3 soil profile depth categories (H) 4 territory exposition categories (E).**

Hierarchy of units: **Topical units**: more than 8 000 Basic Pedoecological Units

Regional units: 75 Pedoecological Regions, 14 Pedoecological Sub-areas

4 Pedoecological Areas

2. Land productivity potential evaluation

For the land productivity potential determination the synthetic-parametric method has been elaborated, which is based on long-term yields analyses from the more than 3000 homogenous fields in various regions and derived parameters values for all PEUs components according to the formula:

$$\mathbf{Pp = (HPJ_v + SE_v + KH_v + Z_v) \,.\, T}$$

Where: **Pp =** productivity potential of PEU, **HPJ - soil units, SE - sloping** and **exposition, KH - skeleton's** and **stoniness, Z – texture, T - climatic coefficient**

The soil / land productivity potential of all, (more as 8 000 BPEUs) have been mapped in scale 1:5 000 and express in point values from 100 to 1 or in categories from 1 to 10.

3. Evaluation of the agricultural and regional land use potential

According to the sum of the point values productive potentials and of the agricultural land survey the following formula has been created: (explained in more detail in Džatko 2002):

$$IPPV = \frac{BH\ BPEJ * agricultural\ soil\ survey}{100}$$

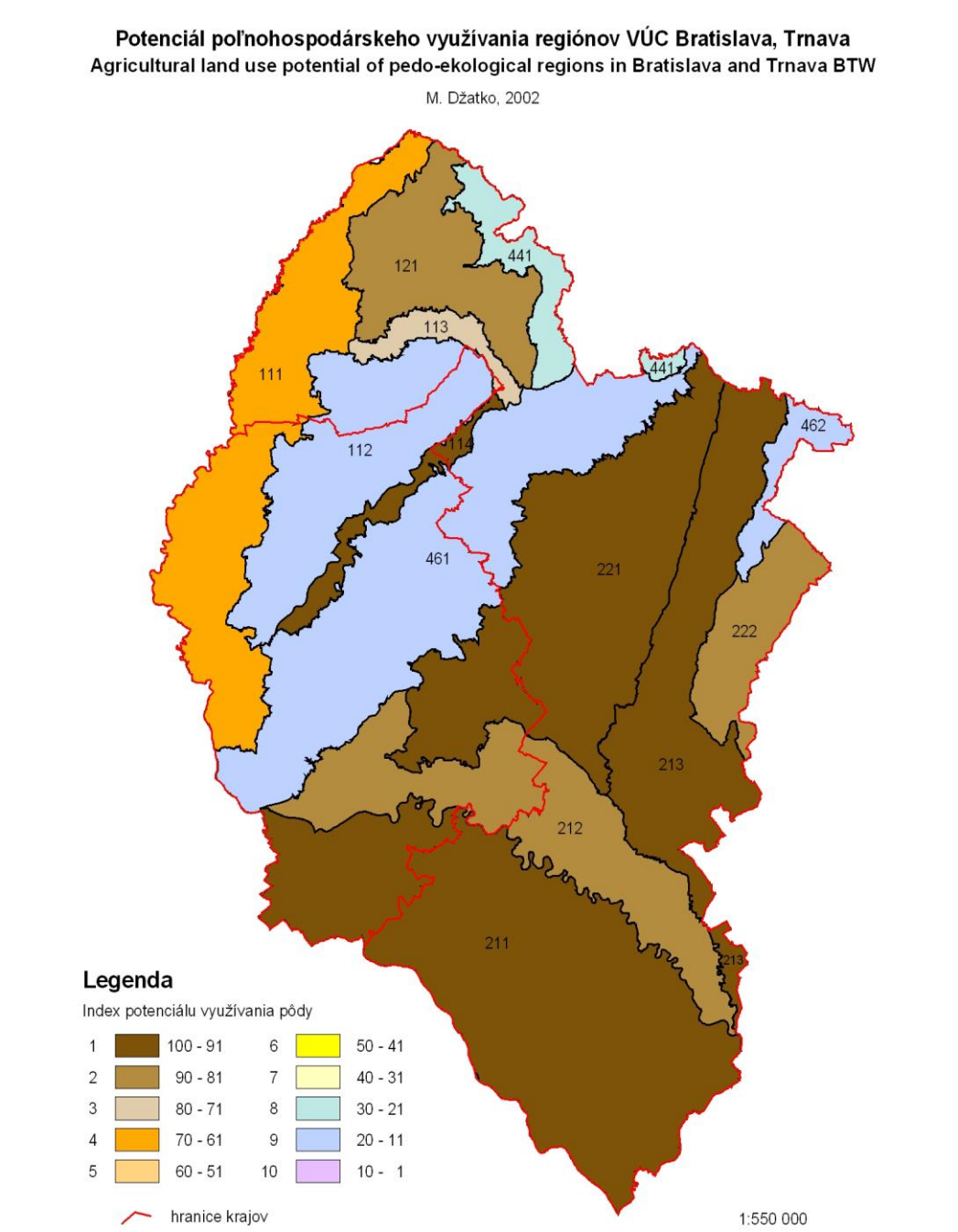
Where: IPPV – Index of Soil use Potential, BH - BPEJ, Soil units point value

Very descriptive example of relevant informative values, focused on regional development are following maps: 1. and 2. Such map documents considerable difference among potentials of agricultural exploitation of the land in single regions but mainly distinctive difference in evaluation between eastern and western parts of Slovakia.

It is, or rather it should be the initial document concerning not only concrete differences of IPPV in frame of neighbouring land units, but also considerable differences of IPPV among districts in western and eastern part of Slovakia.

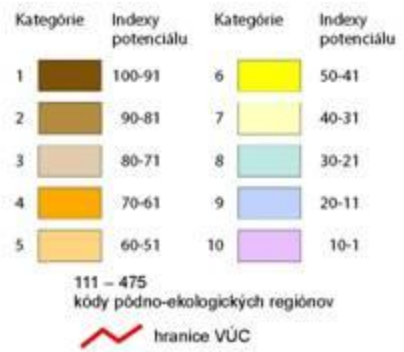
Such difference expressed more concretely should be also first-rate initial base for consecutive modelling of differentiated principles and methods concerning the development not only on topical, but also on regional level. They should be the starting points for the liaise land use planning and sustainable land conservation.

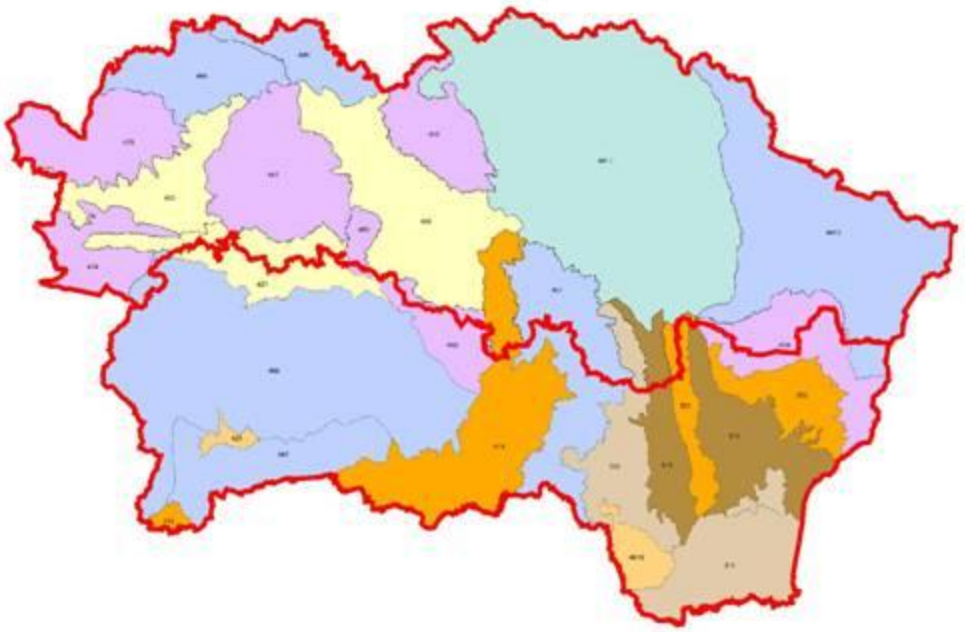
Map 1.



8. Exploitation for the regional development

Map 2 Agricultural land use potential indexes in different regions (M. Džatko, 2002)





VÚC Trnava 79,3
VÚC Bratislava 53,5

Shares of 1. category
VÚC Trnava 55,5%
VÚC Bratislava 25,6%

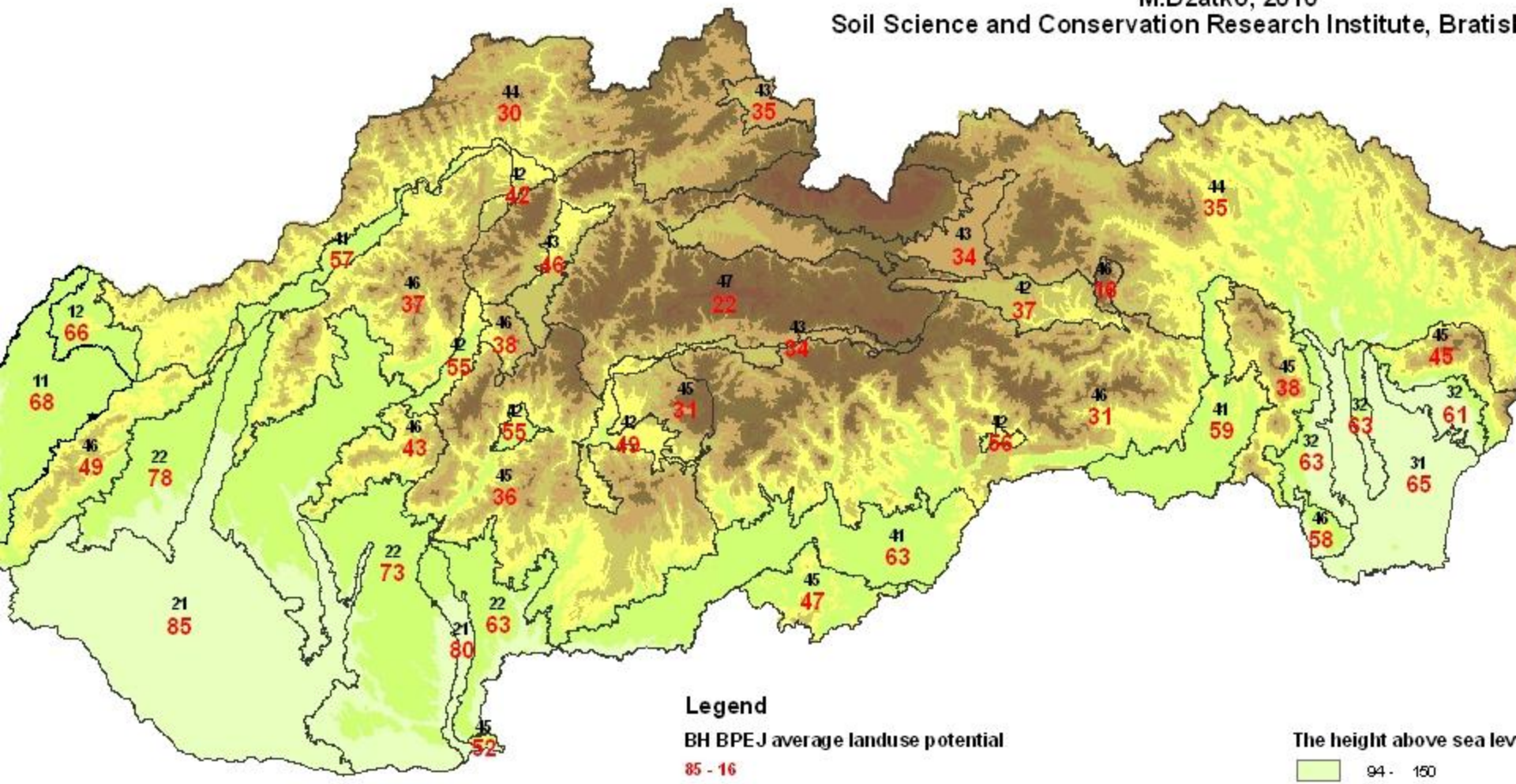
VÚC Košice 39,6
VÚC Prešov 23,0

Shares of 2. category
VÚC Košice 10,5%
VÚC Prešov 0,9%

Spracovanie GIS: M. Granec

Relations among Pedoecological subareas, Pedoecological units potential and the height above sea level in Slovakia

M.Džatko, 2010
Soil Science and Conservation Research Institute, Bratisl



Legend

BH BPEJ average landuse potential

85 - 16

Pedoecological subareas

11 Borská rovina
12 Chvojnická pahorkatina
21 Podunajská rovina
22 Podunajské pahorkatiny
31 Východoslovenská rovina
32 Východoslovenské pahorkatiny
41 Nízko položené kotliny
42 Kotliny stredne výškového stupňa
43 Vysoko položené kotliny
44 Pohoria a vrchoviny flyšového pásma
45 Sopečné pohoria
46 Nižšie pohoria
47 Vysoké pohoria

The height above sea lev

94 - 150
150 - 300
300 - 450
450 - 600
600 - 800
800 - 1 000
1 000 - 1 500
1 500 - 2 655

aboration GIS: D.Kusý, Z.Kleinová

Summary

Very shortly presented results of the land capability potential evaluation and land use planning in Slovakia are the basic documents concerning our gradual knowledge evolution ***from the soil survey and land evaluation to the sustainable land use modelling and planning.*** The final objective is in the elaboration of sustainable land use system models, that will secure the harmonization between land properties, land productive potential and human demands.

As the natural landscape changes are conditional also to the soil and land use changes. Our next aims should be focused on the land use and landscape changes evaluation.

This evokes new discussions about the **searching not only economical stimulus, but also the juristic and namely the moral and ethic mechanisms that will secure relationships harmonization and conditions not only for the soil and land resources conservation, but also the new aspects of the land conservation and land use legalisation.**

Relations among Pedoecological subareas, Pedoecological units potencial and the hight above the see level in Slovakia

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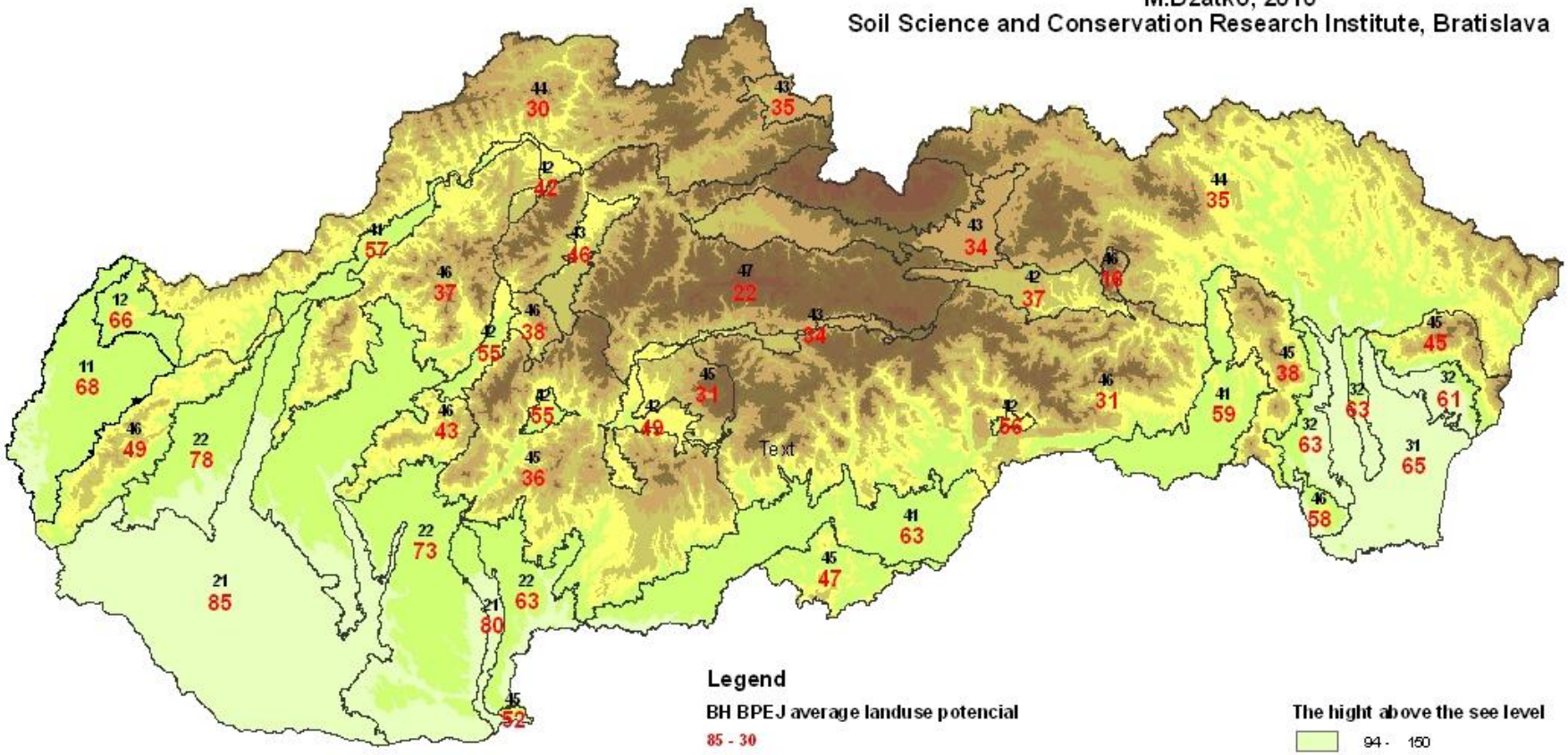

Legend

BH BPEJ average landuse potencial

85 - 30

Pedoecological subareas

11 Borská rovina
12 Chvojnická pahorkatina
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Processing GIS: D.Kusý, Z.Kleinová