

Green Infrastructure and EU agricultural policy

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Introduction

Green infrastructure (1996): „a strategically planned and managed network of wilderness, parks, greenways, conservation easements, and working lands with conservation value that supports native species, maintains natural ecological processes, sustains air and water resources, and contributes to the health and quality of life ...”

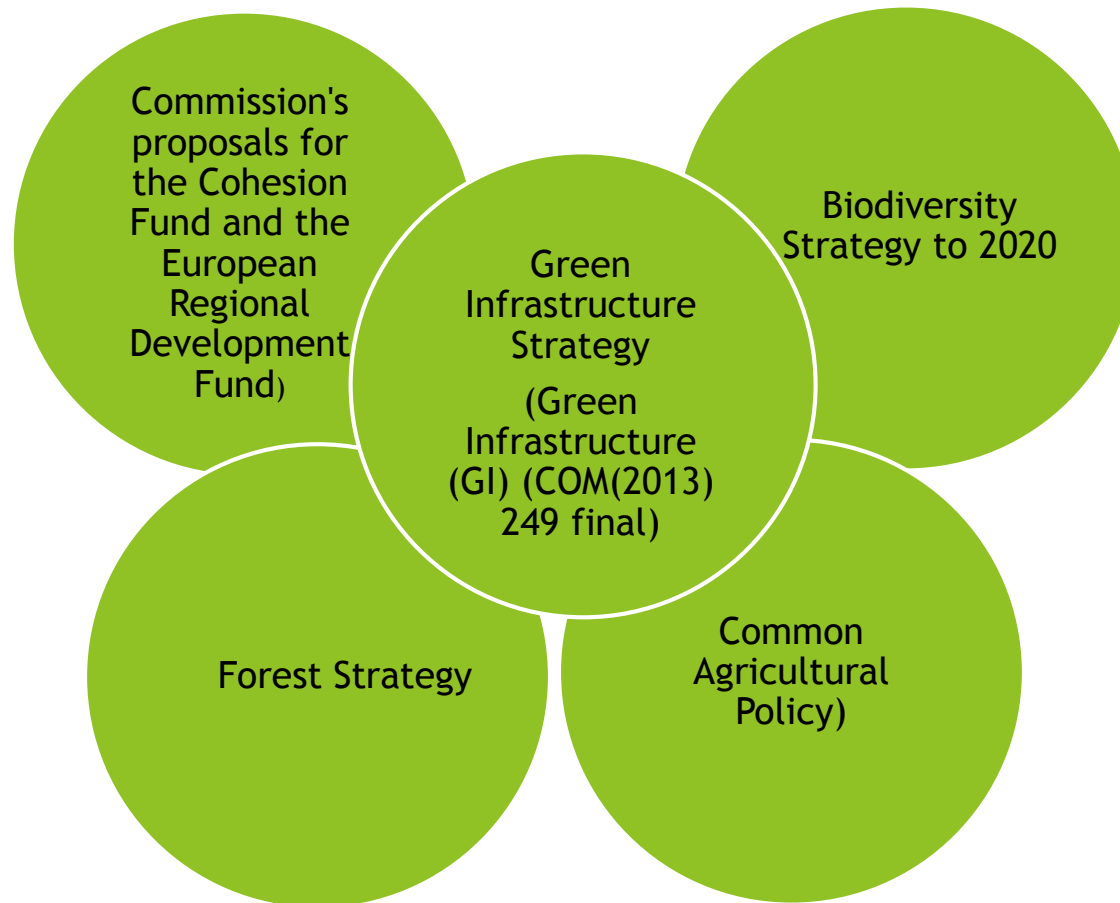
Settlement scale

Landscape scale

Typology of green infrastructure:

- Natural and semi-natural ecosystems, such as pastures, woodland, forest (no intensive plantations), ponds, bogs, rivers and floodplains,
- Extensive agricultural and forest landscapes, large marsh and bog areas, rivers and floodplains,
- Restored ecosystem types,
- High nature value farmland and multi-use forests
- Greenways, green belts, metropolitan park systems.

Multifunctional green infrastructure



- ▶ Green infrastructure (GI) planning as a complex, multifunctional tool is appropriate to realize objectives of rural development.
- ▶ Biodiversity Strategy sets the objectives: by 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15 % of degraded ecosystems.

Potential connections between GI and CAP greening

GI development goals

Improving connectivity

Ecologic corridors, connection of ecologic core areas

Increase multifunctionality

Mosaic like landscape -Diverse land use system/

Enhancing landscape permeability
through the introduction of wildlife friendly land uses

Development of open space system
of settlements

Restoration of traditional landscape character, landscape identity

CAP Greening

Ecologic focus areas

Permanent grasslands

Crop diversification

Agri-environment schemes

Objectives and background

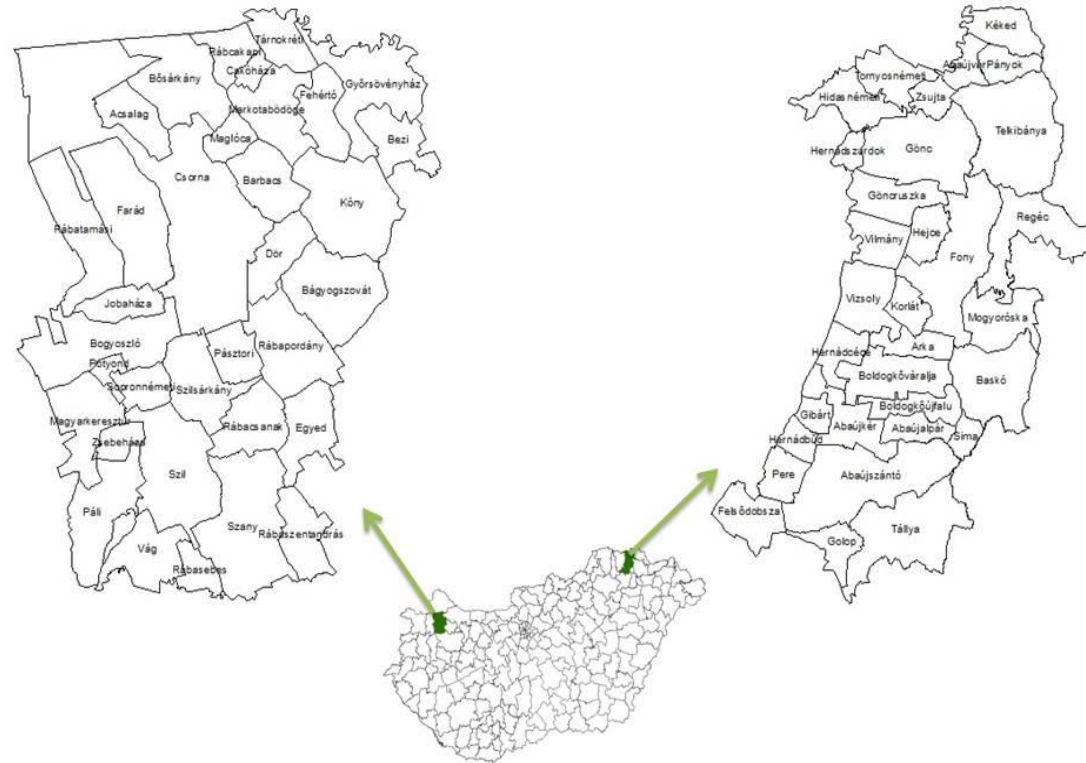
- ▶ **Green infrastructure (GI) planning** is becoming a widely used term in literature but especially a practical tool for conservation and development.
- ▶ **Agriculture** one of the most important economic sector influencing ecosystems. „Greening” initiatives of EU CAP
- ▶ **Objectives:**
 - ▶ to identify the historical changes in the agricultural landscapes in our study areas,
 - ▶ to identify the regularities of these historical policies, regulations in the context of the landscape structure,
 - ▶ to explore the current situation and landscape structures in the study areas,
 - ▶ to find common enforcement options of 'greening' and green infrastructure initiative in the study areas,
 - ▶ to identify potential areas for 'greening' in the study regions (similarities and differences between the study areas),
 - ▶ to build up different scenarios in the pilot regions based on the intensity of the enforcement of 'greening' principles.

Methods and Materials

- ▶ Two pilot regions, Csorna micro-region, Gönc micro-region
- ▶ Historic maps, statistic data to explore the major trends and periods of landscape changes, major driving forces in the pilot regions, present trends of land use changes
- ▶ Corine land cover, statistic data for describing the characteristics of Green infrastructure in pilot regions
- ▶ Parallelism between green infrastructure and CAP
- ▶ Scenarios of possible landscape changes
- ▶ Constrains of CAP Greening for GI development

Pilot regions (micro-regions of Csorna and Gönc)

- **Two rural regions** lying along the Western and North-Eastern borders of Hungary
- Both of them are mostly characterized by **high settlement density with mostly small villages**
- **Gönc** lies in one of the most backward region and **Csorna** and its surrounding in the second richest region of Hungary
- The pilot regions consist of **different landscape character types**



Periods of local landscape changes in the pilot regions

Period	Time	Characteristics of land use, landscape changes Rábaköz	Characteristics of land use, landscape changes Gönc	Drivers of land use changes
I. Survival, adaptation	-1th century	The region was settled since the Neolithic ages, adaptation to nature, hunting, fishing, agricultural use mostly in Rábaköz, Limited agricultural use on the elevated surfaces	The region was settled since the Upper Paleolithic ages, grazing on higher sand-islands of Hernád valley, and on foothills of Zemplén-mountains, small scale deforestation in Hernád valley	<i>Adaptation for better life quality</i>
II. Adaptation, local landscape changes	1-18nd century	Local drainage, the marshland of Hanság hasn't changed much. Deforestation. Grazing, slowly increasing rate of arable land. Specific pond management system in Tóköz.	Local drainage, the marshland of Hanság hasn't changed much. Deforestation in Hernád valley. Optimal extention of arable land Vine yards and fruitgardens on foothills of Zemplén-mountains	<i>Adaptation, local changes for better life quality.</i>

Landscape changes in Rábaköz

Period	
I. Survival, adaptation	
II. Adaptation, local landscape changes	1- ce



Map from 1782 Source: Papp-Váry (1989)

Large scale landscape changes in Rábaköz

Period	Time	Characteristics of land use, landscape changes	Land use changes Hanság, Tóköz	Land use changes Rábaköz	Drivers of land use changes
III. Large scale landscape changes	End of 18th century – I.WW.	Intensive drainage, river control, retreating wetlands of Hanság Growing rate of arable land, developing stock-raising, granges. Homecrafts based on local resources, milling industry. Diverse by usages: hay, cane production, bee-keeping etc..	Drastic increase of arable land, decrease of grassland 1865: 40% arable land, 54% grassland; 1913: 68% arable land, 27% grassland	Drastic increase of arable land, decrease of grassland Intensive agricultural landscape 1865: 62% arable land, 25% grassland 1913: 77% arable land, 12% grassland	High yields by changes of the landscape in large estates. Instead of adaptation great scale land use changes.
IV. Intensive land use	20th century–1980's	Continuing drainage, eventhough the inner parts of Hanság is under drainage Intensive crop production and stock-raizing. In Hanság alder forest misplaced by poplars. Gradually shrinking disappearing by-usages: bee-keeping, hay production, peat mining.	Low but stady increase of arable land, decrease of grassland, increase of forest rate Intensive, industrial agriculture 1935: 61% arable land, 23% grassland 1984: 57% arable land, 21% grassland	Szántók arányának kismértékű csökkenése, gyepterületek stagnálása, erdők arányának növekedése 1935: 78% arable land, 11 % grassland 1984: 71% arable land, 11% grassland	The values of the societa are formed by the socialist regim, intensive urbanization process. Land use is led by rationalisation industrial agriculture. Decreasing value of rural life.
V. Nature protection, wetland restoration	Since the end of 1980's	Growing importance of nature protection, Natura 2000 network Increasing crop production shrinking stock-raising.	Continous increase of arable land, Natura 200 in Hernad-valley	Vine yars and fruit prod., abandoned fruitgardens Zemplén Landscape Protection Area Tokaj Vine Region	Contonouous conflicte between economy and nature protection. Strong constrains of nature protection. Growing land concentration.

Large scale landscape changes in Rábaköz

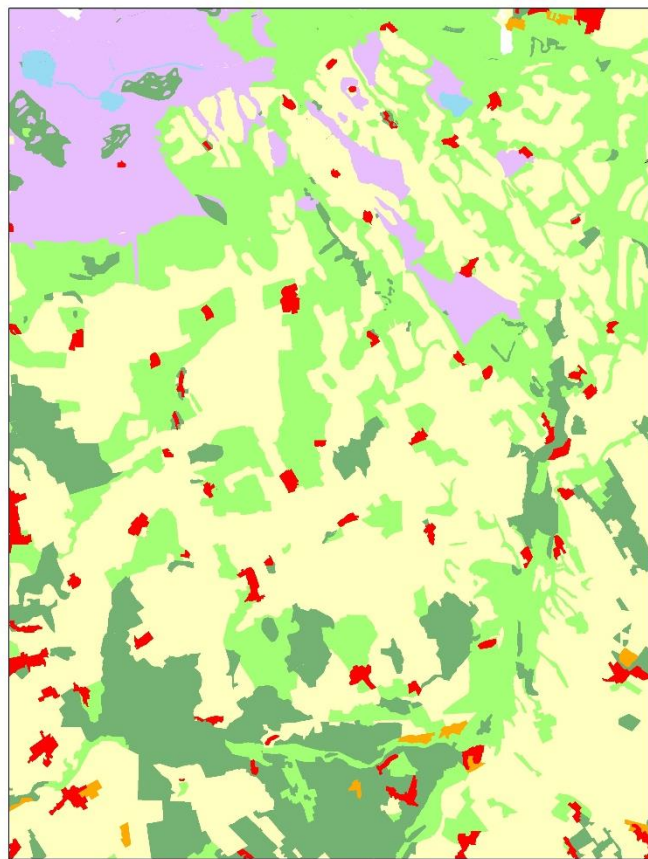
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**VI. Greening of agriculture/ Green infrastructure development?
Or further intensification**

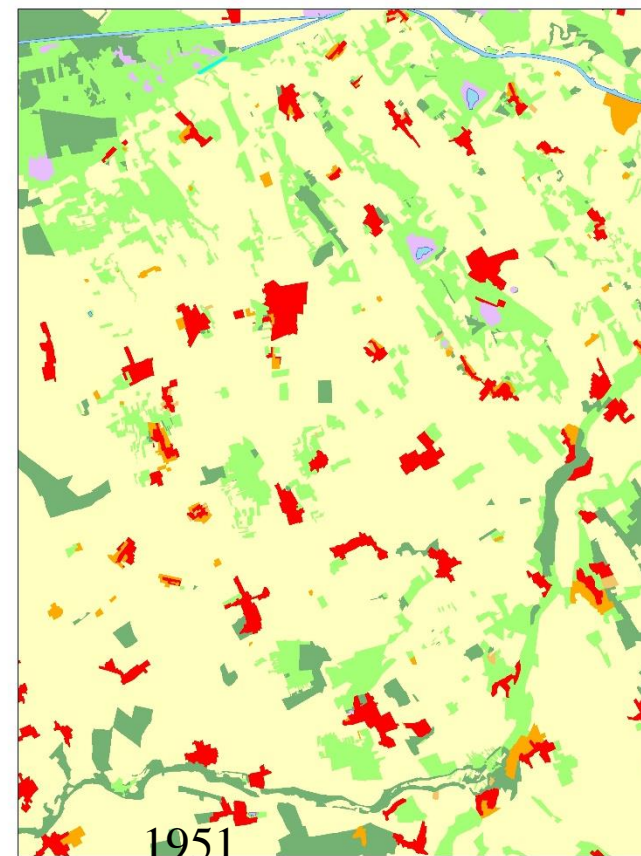
Large scale landscape changes in Gönc

Period	Time	Characteristics of land use, landscape changes	Land use changes Gönc	Land use changes Gönc	Drivers of land use changes
III. Large scale landscape changes	End of 18th century – I.WW.	Grasslands and forest were turned to arable land even in the floodplain of Hernád	Bársonyos was regulated in 1860's Drastic increase of arable land, decrease of grassland 1865: 44,7% arable land, 29,8% grassland; 1913: 69,1% arable land, 17,8% grassland	In 1880's fyloxera destroyed the vineyards, partial revival of the vine region, mostly fruitgardens and arable land In 1895 2 million fruit trees were registered in the region	High yields by changes of the landscape in large estates. Instead of adaptation great scale land use changes.
IV. Intensive land use	20th century–1980's	Continuing river regulation Stady land use system Effects of Trianon: the region become a peripheric region	Regulation of Hernád in 1910's Intensive crop production and stock-raizing.	Fruit production Extending vine yards in Southern region	The values of the societa are formed by the socialist regim, intensive urbanization process. Land use is led by rationalisation industrial agriculture. Decreasing value of rural life.
V. Nature protection, wetland restoration, growing intensification of agriculture	Since the end of 1980's	Growing importance of nature protection, wetland restoration in Hanság, Natura 2000 network Increasing crop production shrinking stock-raising.	Continous increase of arable land, decrease of grassland, Designation of nature protection areas 2011: 68% arable land, 16% grassland	Continous increase of arable land, decrease of grassland 2011: 74% arable land, 6% grassland	Contonouos conflicte between economy and nature protection. Strong constrains of nature protection. Growing land concentration.
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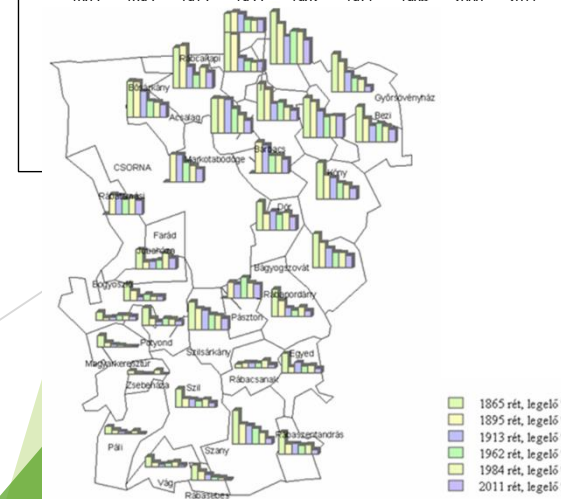
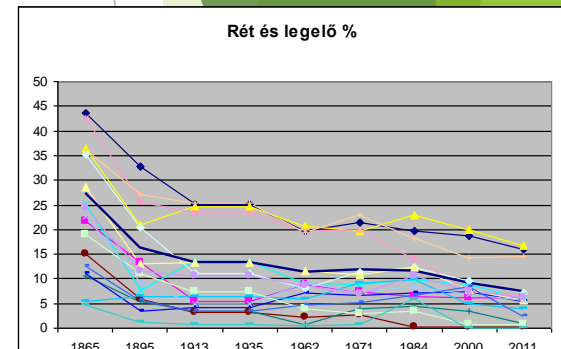
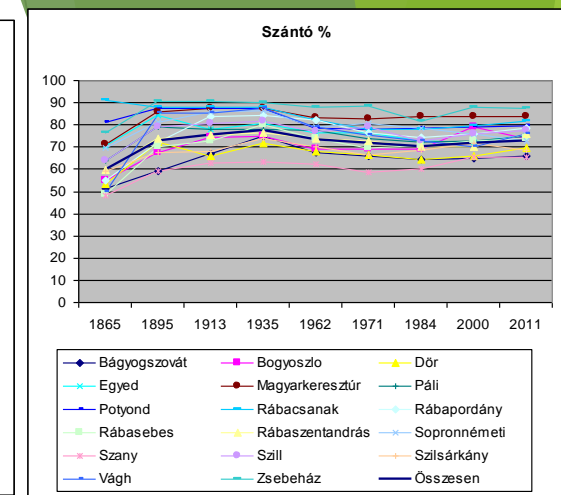
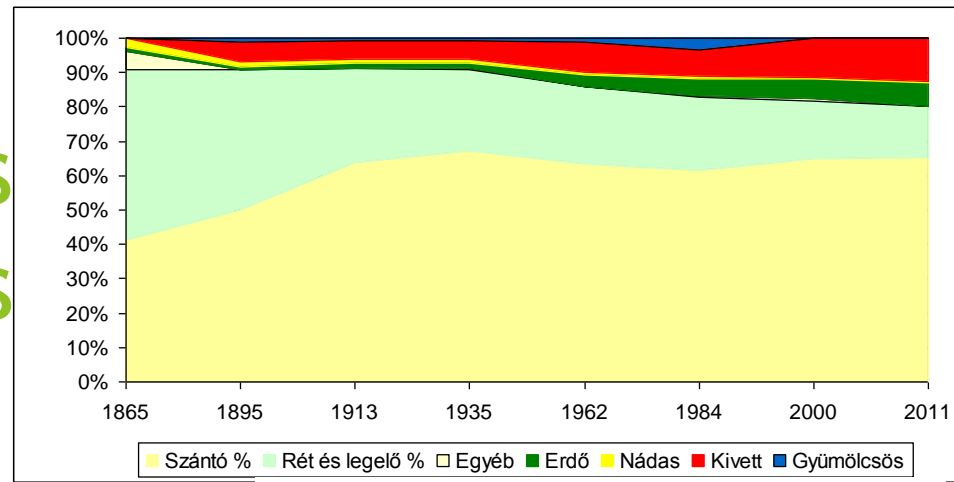
Trends and volumes of land use changes



1766-1785



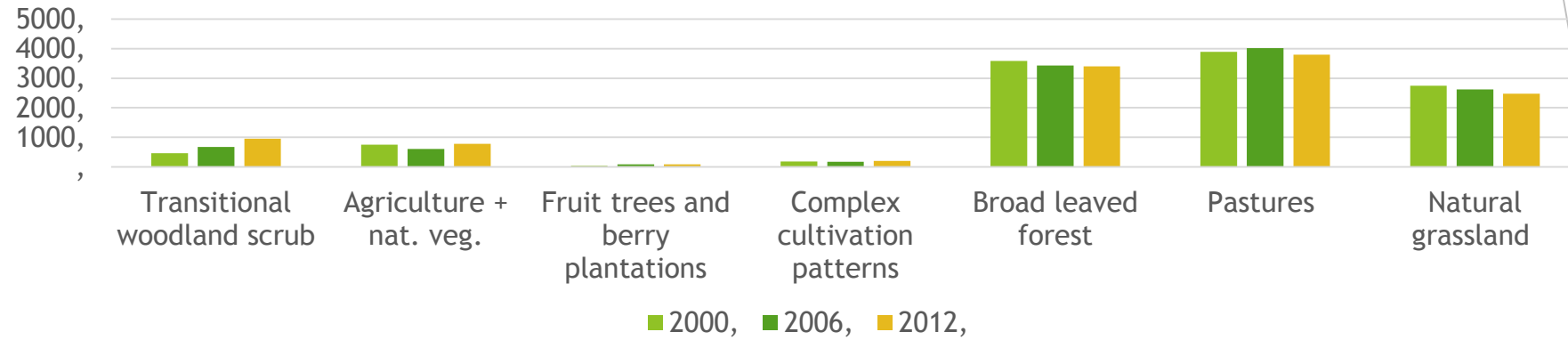
1951



- Település
- Szántó
- Komplex műv.
- Gyep, legelő
- Szőlő, gyümölcs
- Erdő
- Láp, mocsár
- Vízfelület

Present trends

Land use changes 2000-2012, Corine Land Cover, Rábaköz-Hanság



Land use changes 2000-2012, Corine Land Cover Gönc



Present state of GI in the pilot regions

Micro-region of Csorna

- ▶ Hanság-Tóköz: High ecologic value of the remnants of the former marshland, mosaiclike landscape in the drained marshland.
- ▶ Rábaköz: Plain mostly monotonous agricultural landscape, missing networks of green infrastructure.
- ▶ Riparian forests and meadows along river Rába, high ecologic value.

▶ Micro-region of Gönc

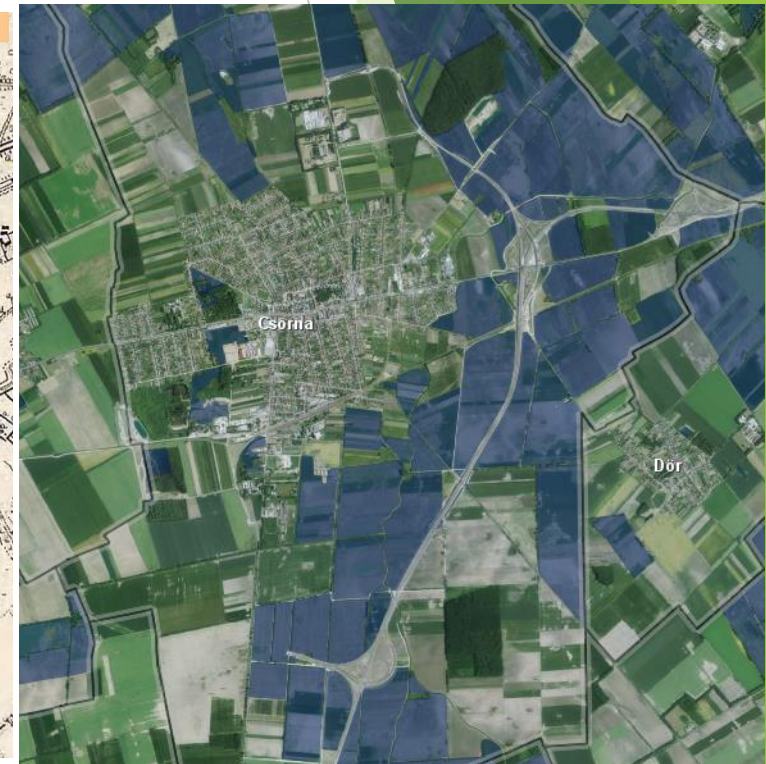
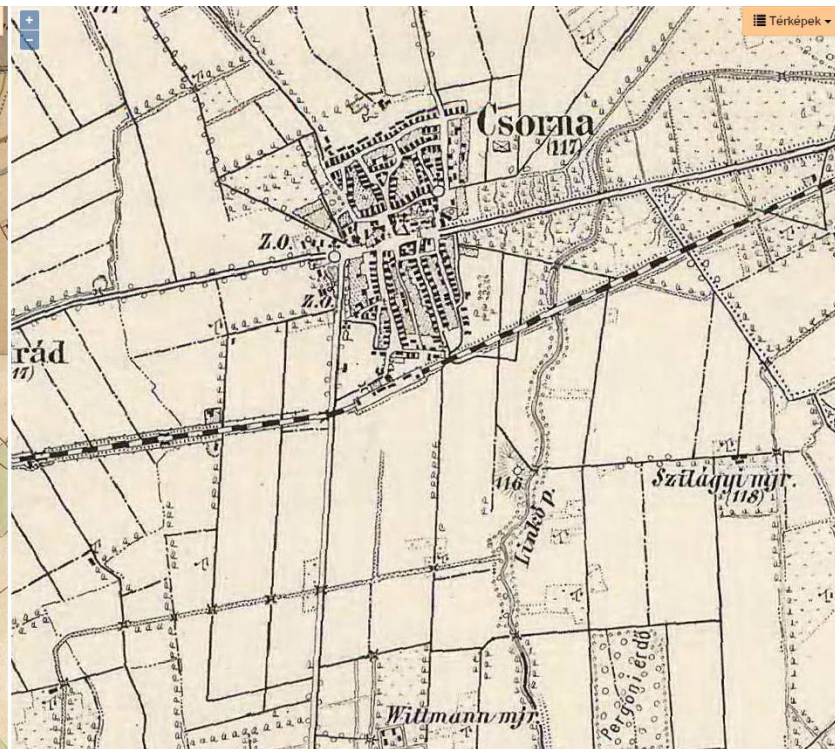
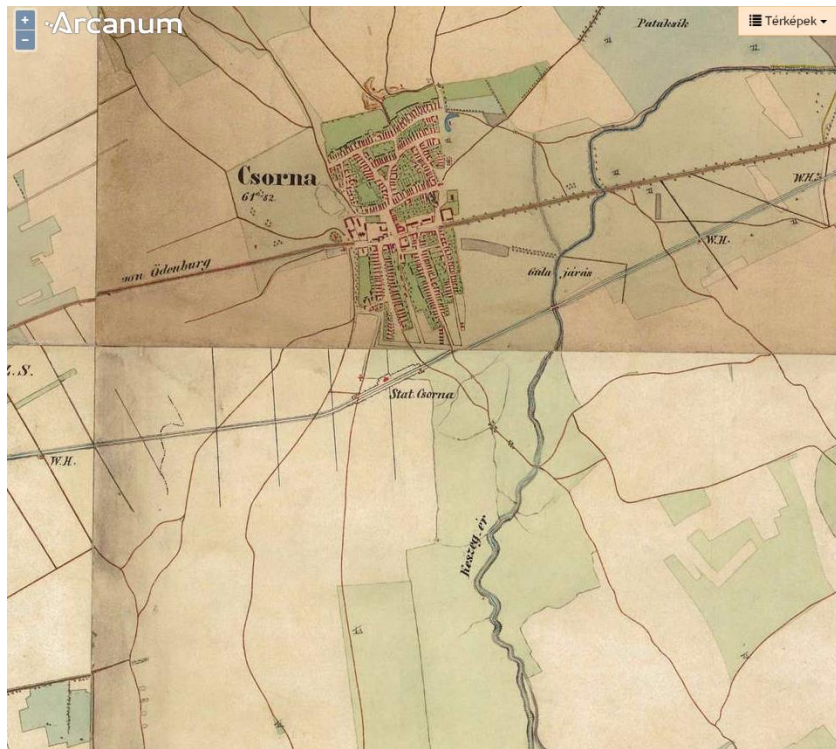
- ▶ Mountains of Zemplén: High ecologic value of the extensive forests.
- ▶ Hernád-valley: Plain mostly monotonous agricultural landscape, the only elements of the GI networks are the valleys of the creeks between the Mountains and the River Hernád. Extensive orchards on the foothills of Zemplén with moderated ecologic value.
- ▶ Along river Hernád: high ecologic value of the riparian forests and backwaters.



Present, Land use conflicts, examples

Decreasing biodiversity in Rábaköz

Frequent damages caused by excess water on plough land



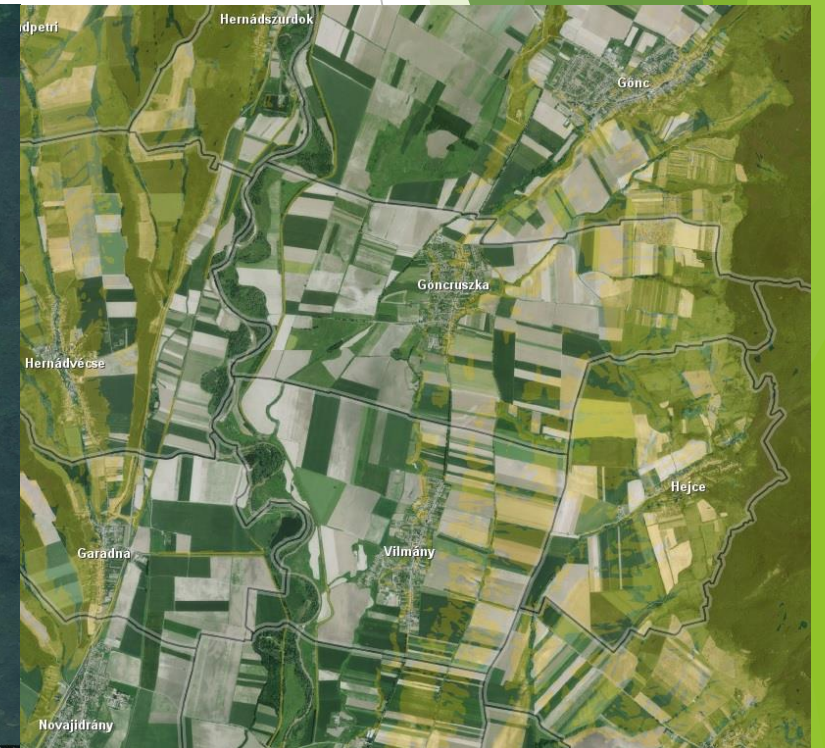
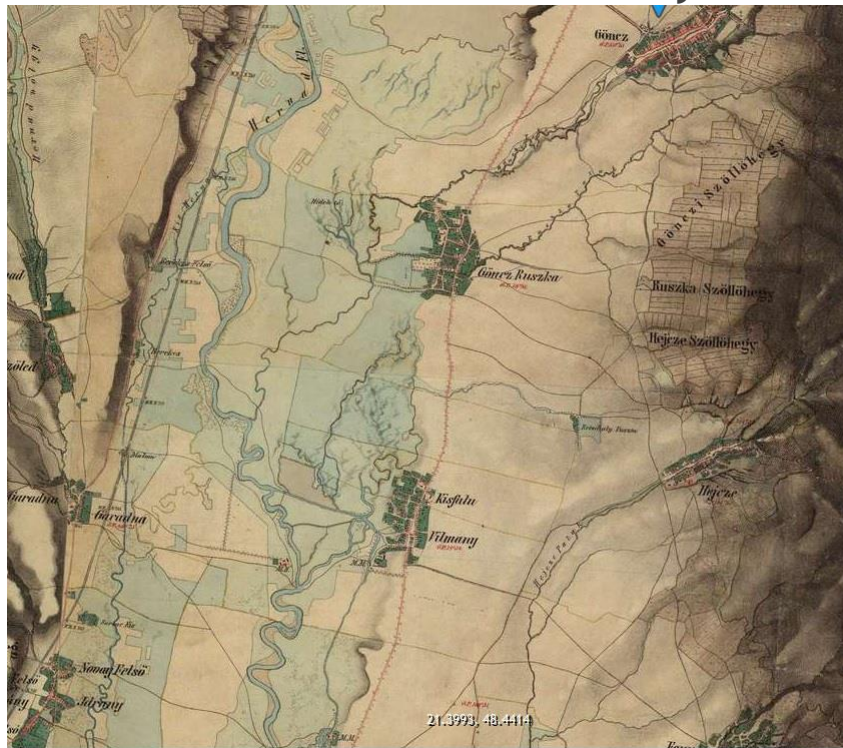
Land use in the 19th century
II. Military survey, 1845-1846

III. Military survey 1872-1884

frequent occurrence of
excess waters

Present, Land use conflicts, examples

Land use in the 19th century

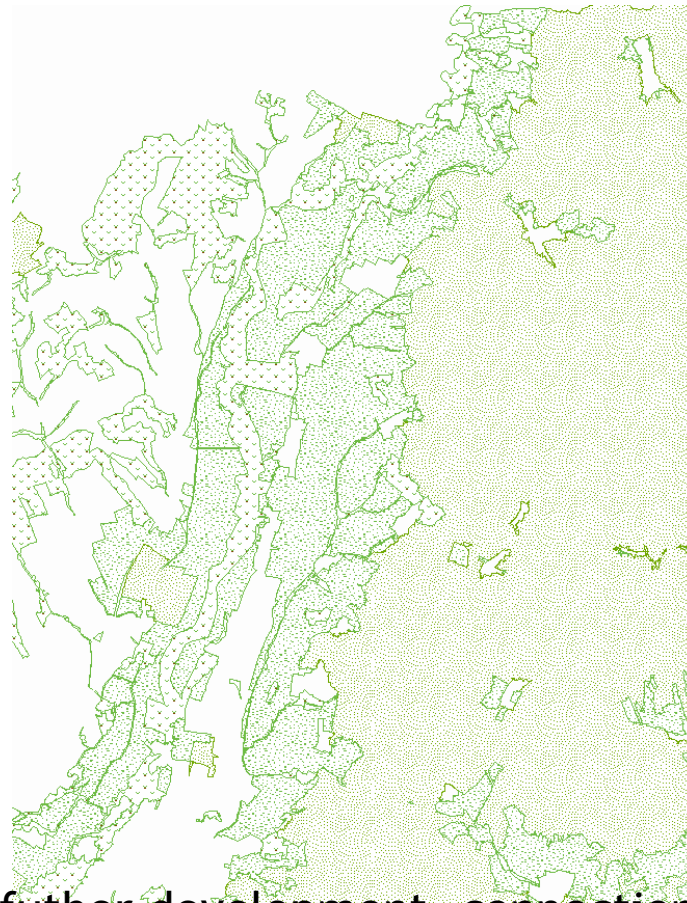
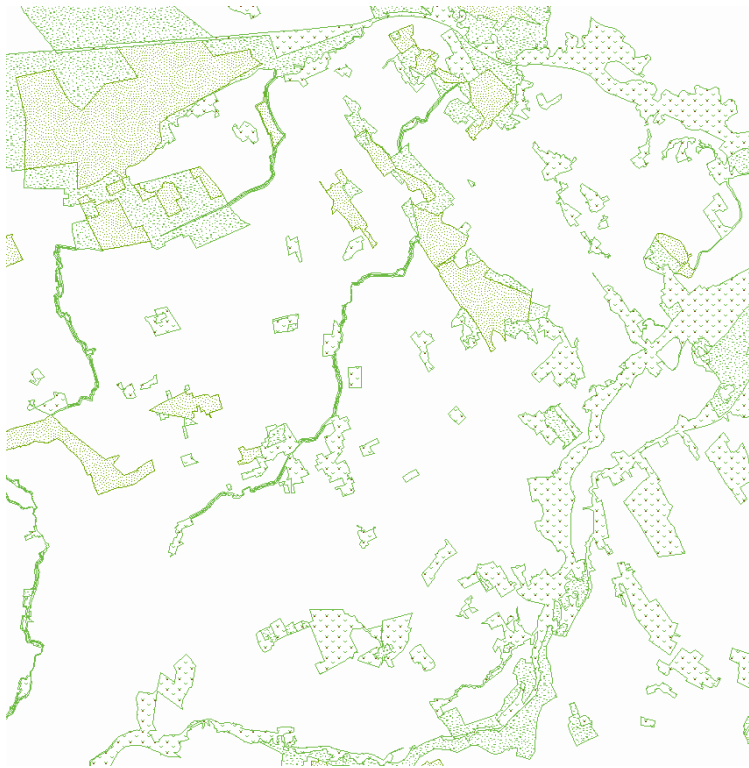


II. Military survey, 1845-1846

Google Earth (2016)

potential of erosion

Base of Hungarian Green infrastructure system-National Ecologic Network



Just the present state, no incentive, guideline for further development, connections

Green infrastructure development goals

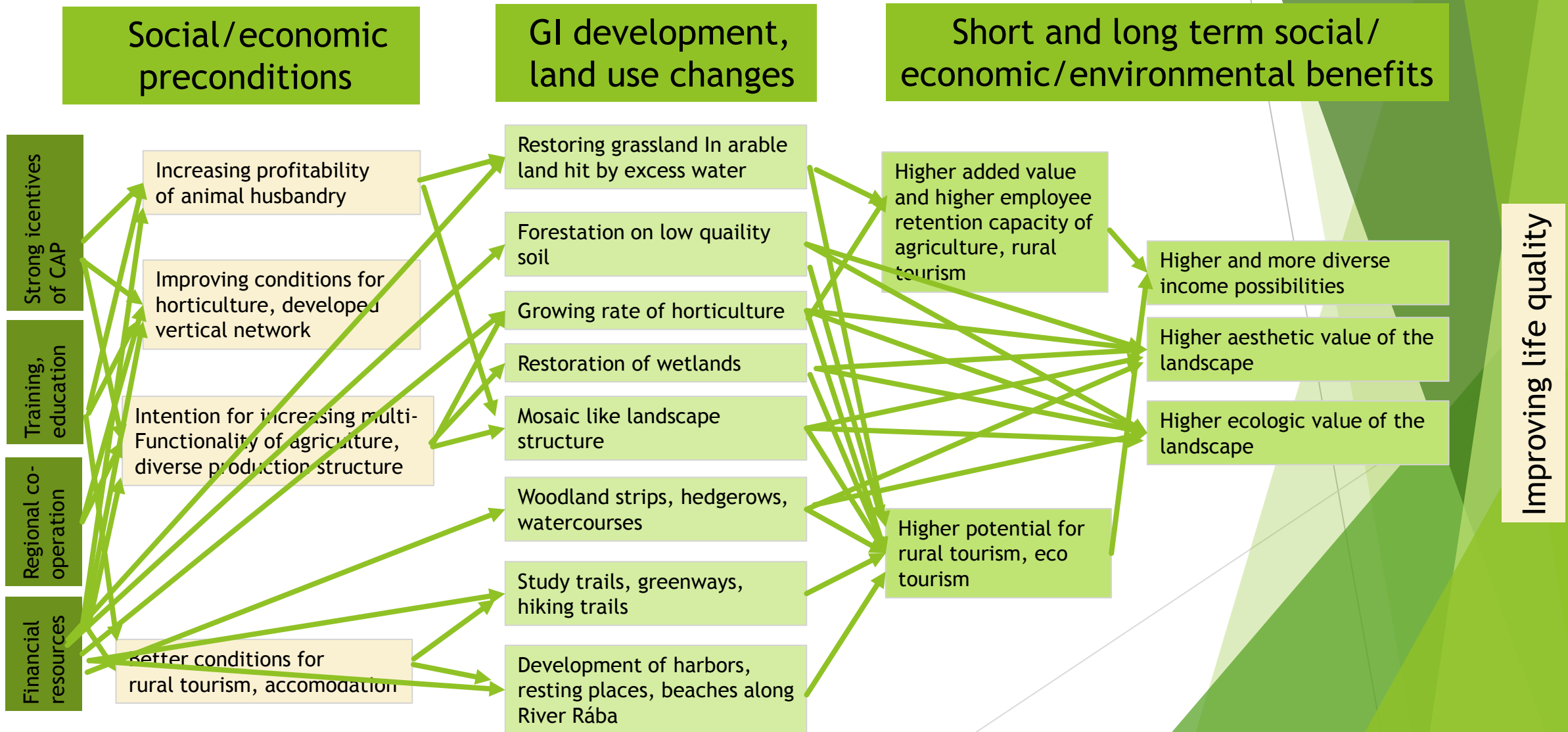
Micro-region of Csorna

- ▶ Diversify the agriculture, enhancing multifunctional production structure (higher rate of horticulture, animal husbandry, grassland)
- ▶ Increase the ratio of grass fields especially in areas of frequent excess water
- ▶ 5-10 m wide buffer strips along watercourses
- ▶ Increase the ratio of forest at least 3% on settlement level 10% on regional level
- ▶ Protection and development of semi-natural ecosystems in the agricultural land (maintenance and dev. forest belts, hedges etc.)
- ▶ Enhancing eco-tourism potential by GI development (Hanság, Rábaköz, Rába)

Micro-region of Gönc

- ▶ Decrease the intensity of the agriculture in the Hernád-valley
- ▶ Protection and development of semi-natural ecosystems in the agricultural land especially in the valley
- ▶ Diversify the agriculture
- ▶ Development of the green connection between the Mountains of Zemplén and the river Hernád
- ▶ Increase the width of the riparian forests along the river (and create new buffer zones, if it is necessary)
- ▶ Maintenance of the old, traditional orchards on the foothills of Zemplén
- ▶ 5-10 m wide buffer zone along watercourses (especially along the creeks of the Hernád-valley)
- ▶ Enhancing eco-tourism potential by GI development

Green infrastructure development



CAP Greening-constrains for GI development

- ▶ Elements that are crucial for GI may also be protected under cross-compliance: Landscape features, Buffer strips
- ▶ Use of crops that are not necessarily beneficial to biodiversity and permitting the use of fertilisers and pesticides
- ▶ Wide definition of **permanent grassland** - can be ploughed and reseeded - Baseline 2015, drastic drop in ratio of grassland,
 - ▶ (Drop 2000-2012 Csorna : Pastures -3%, Natural gr.l.: -10%; Gönc: Pastures -2%, Natural gr.l.: -63%)
- ▶ It allows 5% loss of grassland on regional level, which is just slowing down the trends
- ▶ Crop diversification measures do not really mean any ecologic heterogeneity, it do not appear on landscape level, on lp. structural level

Scenarios

	Trend scenario	Greening (basic)	High level of GI development, growing significance of rural development
Driving forces	Maximum profit from agricultural land, decreasing employee retention capacity of agriculture	Protection of permanent grasslands, partial protection of non-production areas otherwise continuing trends in agricultural production	Strong incentives in rural development and agricultural policy for changing, diversifying production structure, nature protection
Major land use changes	Decreasing rate of grass fields Increasing rate of arable land and transitional woodland-scrub, increasing land use concentration	Lower, but steady decreasing grasslands, continuous growth of arable land,	Growing rate of grassland, forests, growing rate of horticulture, mosaic like landscape
Structure of agriculture	Decreasing multifunctionality, growing significance of arable land	Decreasing multifunctionality, growing significance of arable land	Diverse production structure, high rate of sectors with higher added value, increasing employee retention capacity of agriculture
Effect on biodiversity	Decreasing biodiversity	Positive effects are questionable, probably in a lower rate, but steady decrease of biodiversity	Decrease is stopped
Demographic trends	Continuing strong depopulation and aging process in the region	Continuing strong depopulation and aging process in the region	Lower rate depopulation and aging process in the region

Summary

- ▶ In the future such great land use changes are not expected like in the past
- ▶ Further intensification in agricultural production, further homogenisation of landscape
- ▶ Nature protection measures focusing on existing protected elements not on GI development, connections
- ▶ In this form CAP Greening can not really enhance GI development, it is just slowing down (et least) the biodiversity loss
- ▶ Much stronger incentives in rural development, agricultural structural changes would be necessary



**THANK YOU FOR YOUR
ATTENTION!**

