



**CHANGING AREA AND REGIONAL
DISTRIBUTION OF GRASSLANDS IN THE
CZECH REPUBLIC AFTER 1960**

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Land use processes in the Czech Republic in 1990–2008

- **Suburbanisation**
 - Growth of built-up and „other“ areas by 219 km²
 - **Afforestation**
 - Growth of forested areas by 240 km²
 - **Grassing over**
 - Growth of permanent grasslands by 1.514 km²
 - **Land abandonment**
 - Abandoned agricultural land estimate (2000): 3.000 km²
- **Loss of arable land** by 2.066 km²

(total area of the Czech Republic: 78.865 km²)

Structure of this presentation

- **A. Changing area** of grasslands in the Czech Republic
 - 1830–1960–1990–2008
- **B. Changing spatial distribution** of grasslands in the Czech Republic
 - 1960–1990–2008
- **C. Explanation** of changes in the area and spatial distribution of grasslands in the period 1990–2008
 - Economy
 - Policy

Permanent grasslands



Meadows



Pastures

Importance of grasslands:

Economic – nutrition for animals, opportunity to use marginal plots

Ecological – maintaining biodiversity, preventing floods and water erosion

Aesthetic, recreational

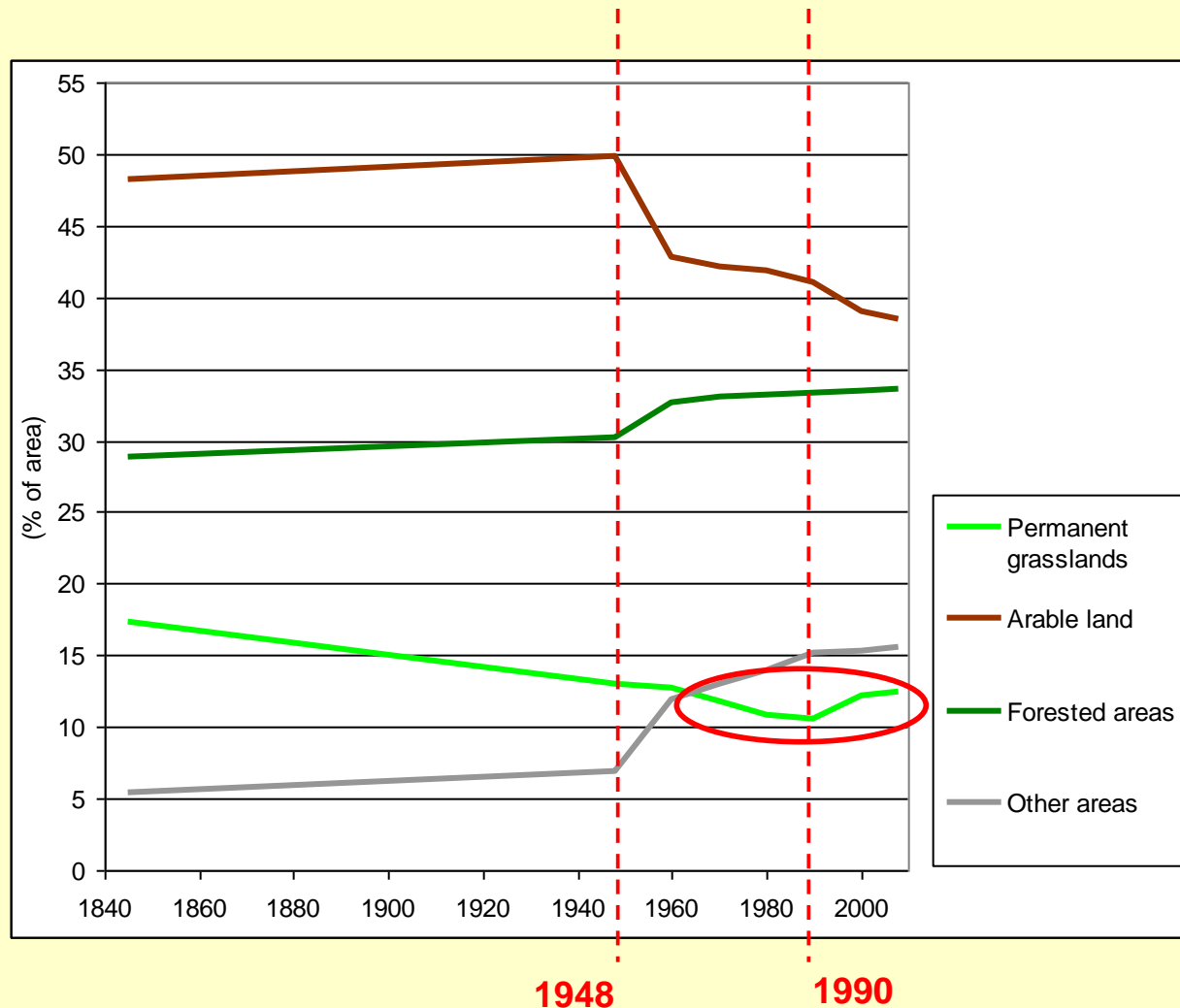
A. Land use changes in the Czech Republic 1845–2008

Decreasing
importance of
grasslands until
1990:

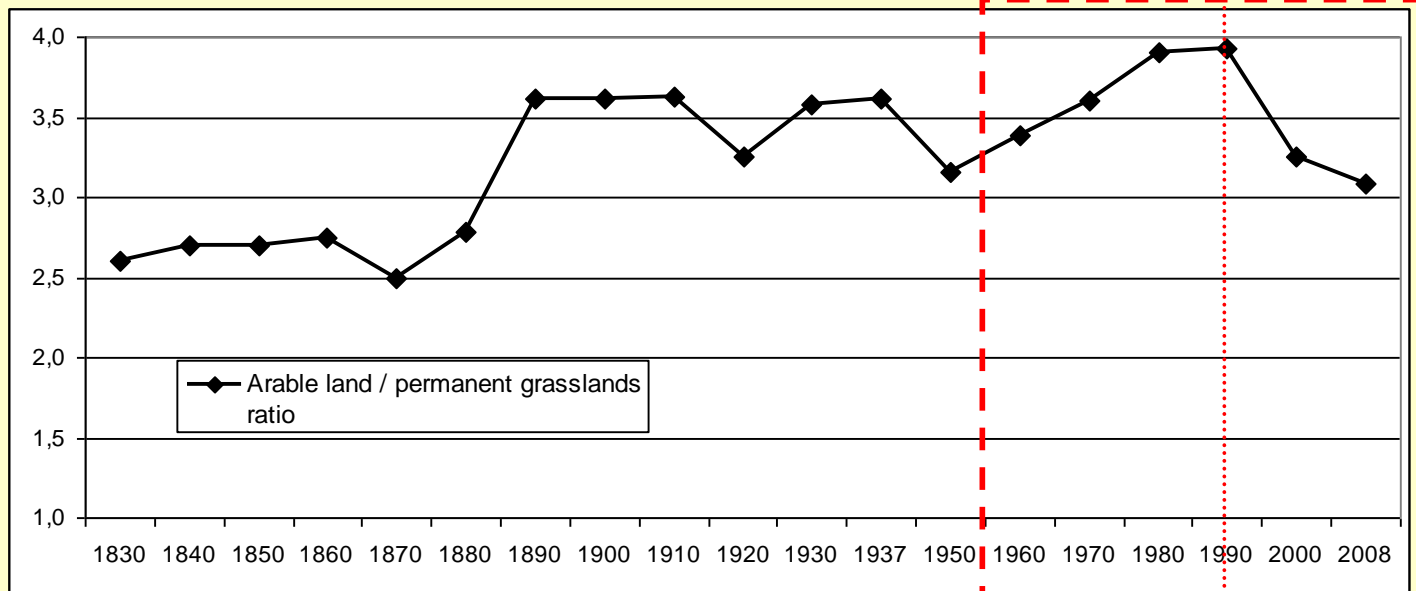
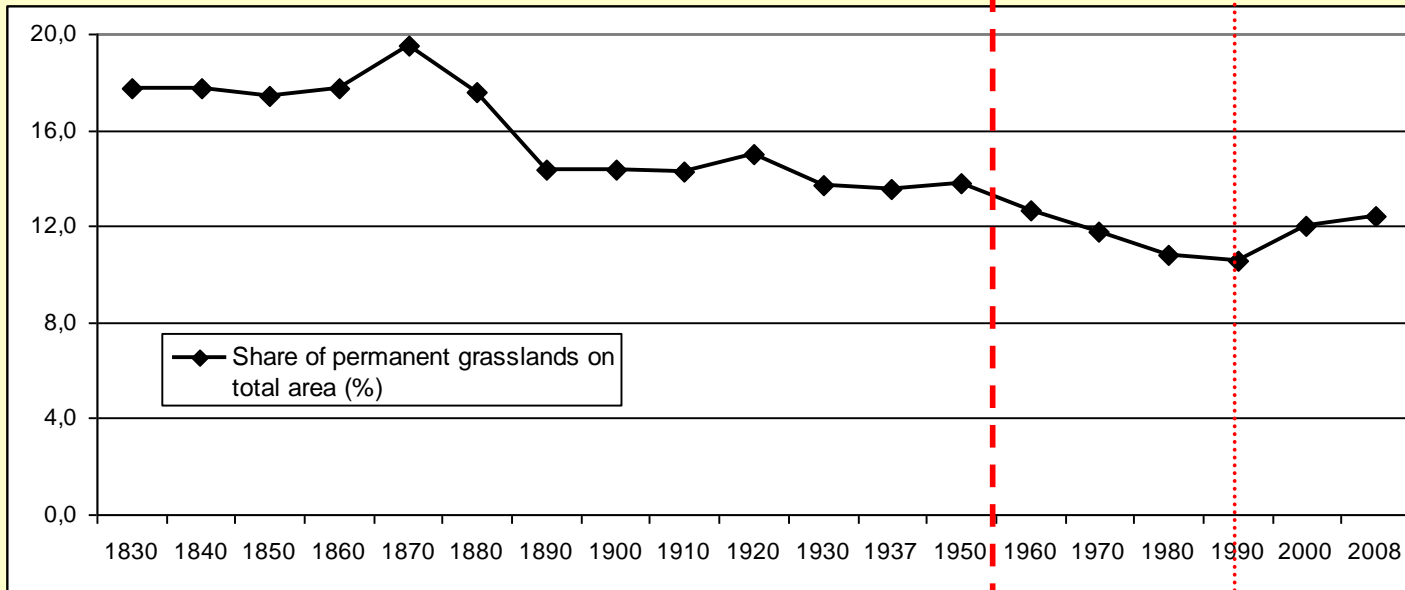
From hay and
pastures to silage
and stables

From horses and
oxen to tractors
and harvestors

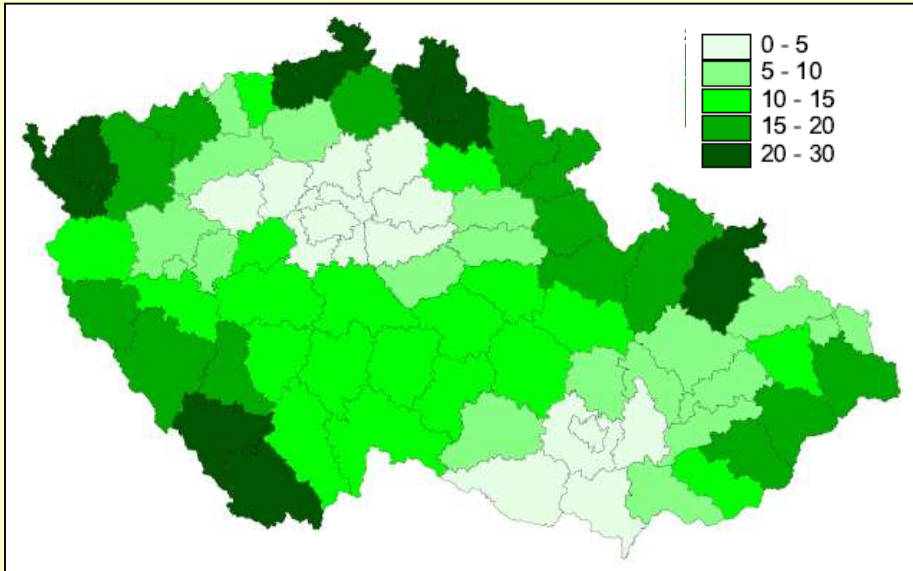
From manure to
chemicals



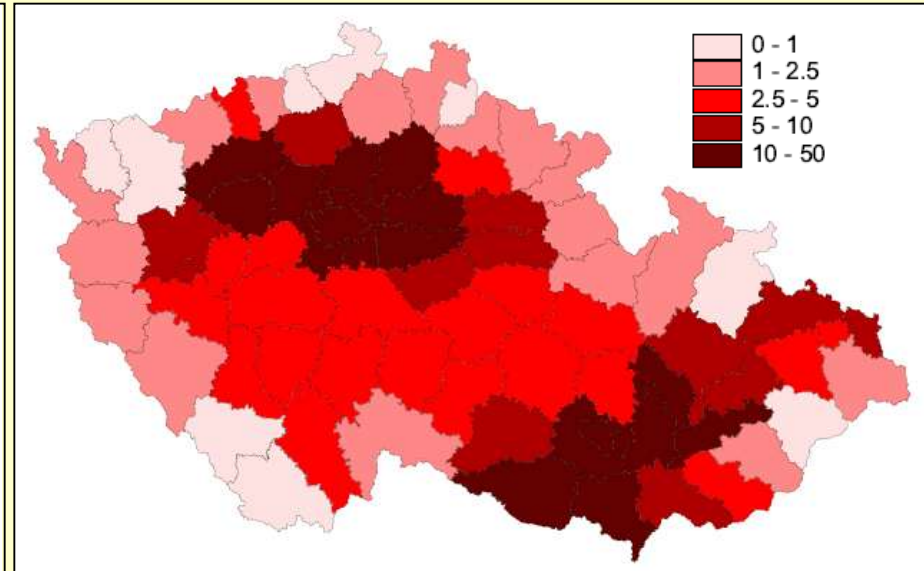
A. Changing area of grasslands 1830–2008



B. Spatial distribution of grasslands (2008)



Share of grasslands on total area (% , 2008)

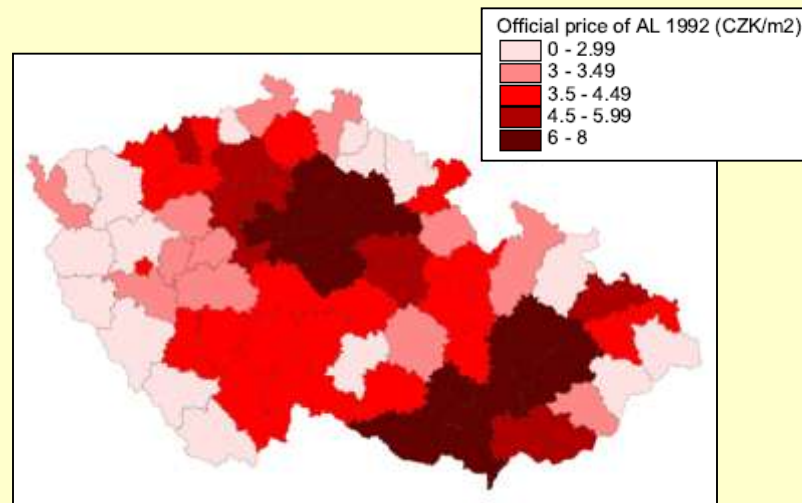


Arable land / grasslands ratio (2008)

Spatial units:

Districts (N = 76;
average area =
1.020 km sq.)

Data: Cadastral
statistics

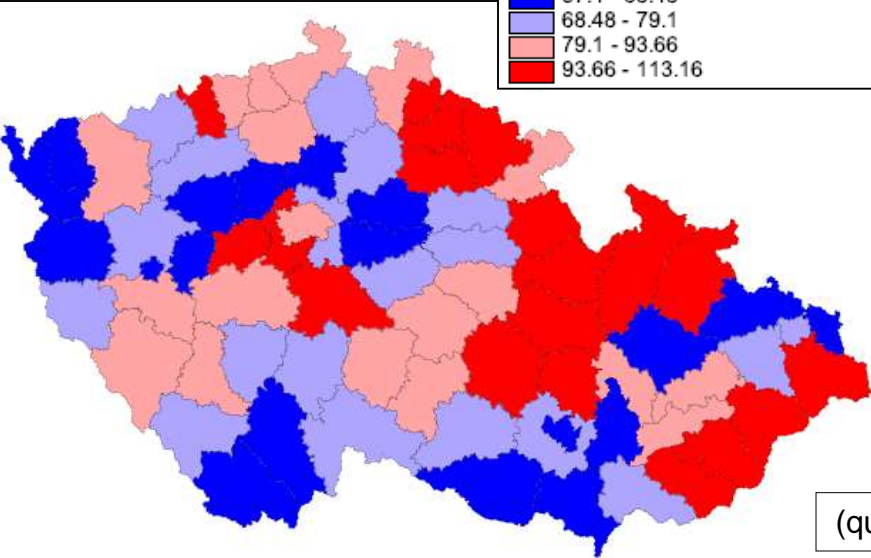


Official price of agricultural land (CZK/m²):

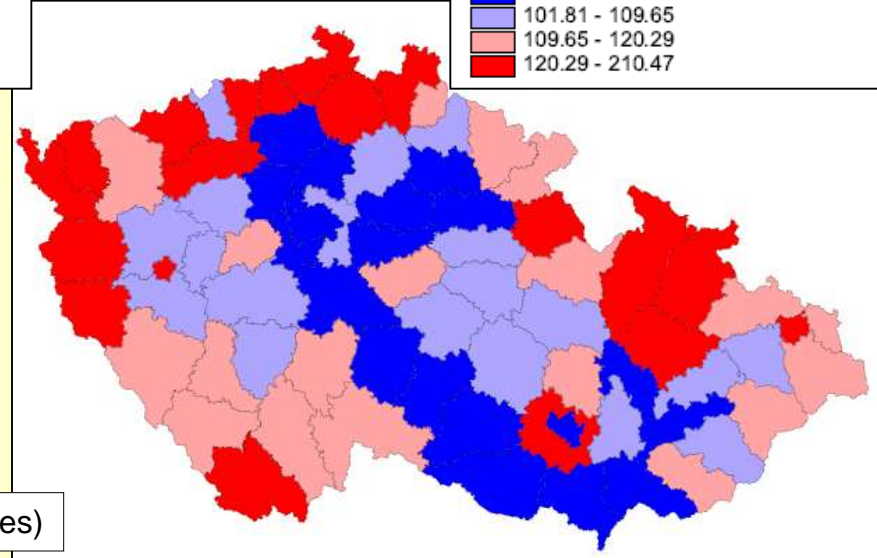
An aggregate
indicator of suitability
of natural conditions
for farming

B. Changing spatial distribution of grasslands (1960–2008)

Changing share of grasslands 1961 - 1990 (%)



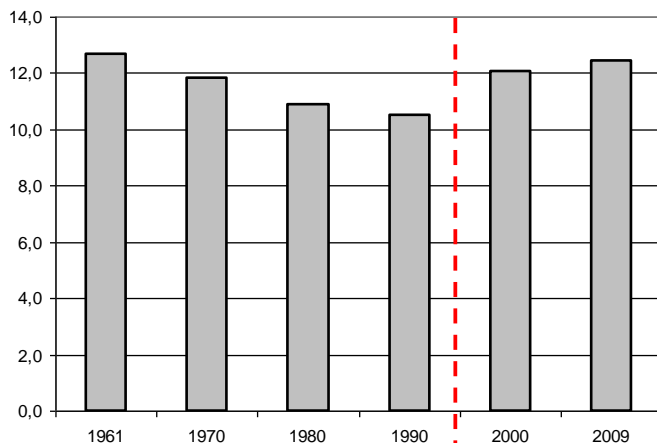
Changing share of grasslands 1990 - 2009 (%)



(quartiles)

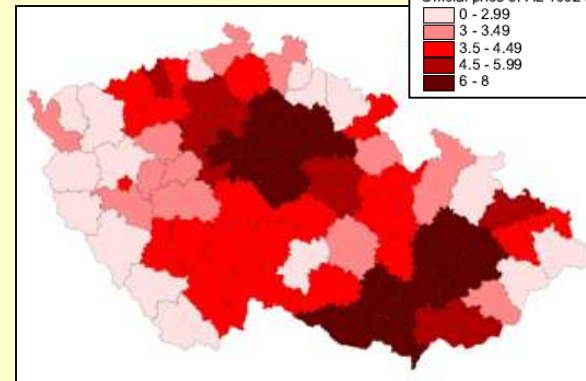
1961–1990

Share of permanent grasslands on total area (%)

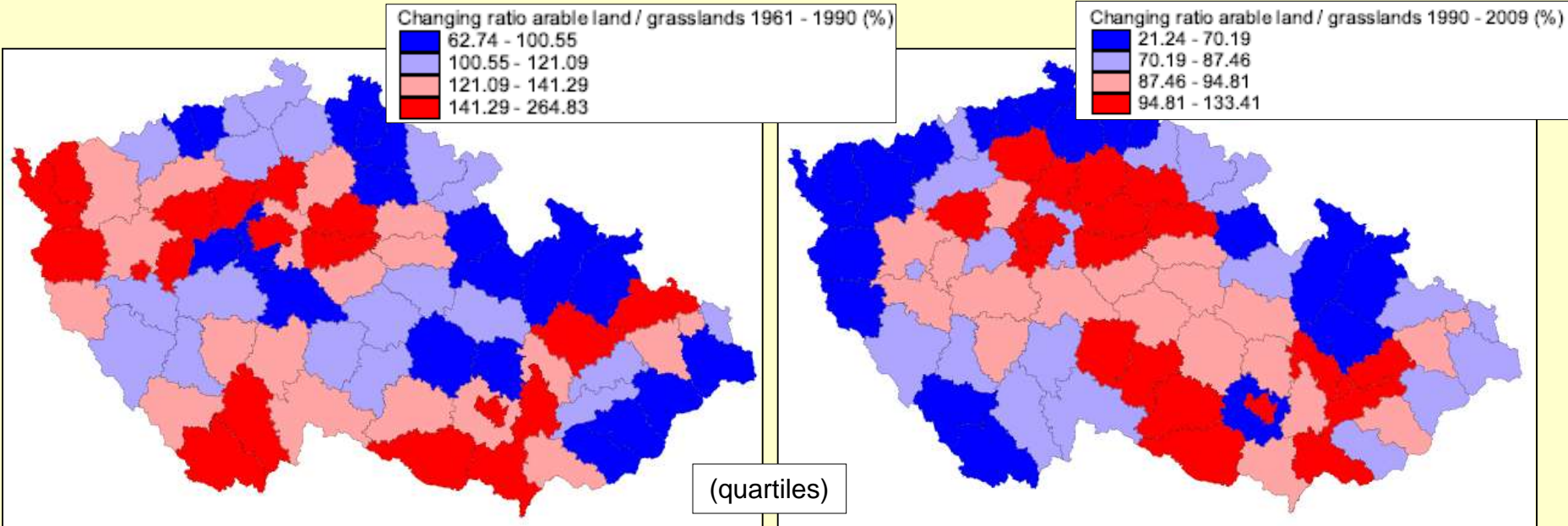


1990–2008

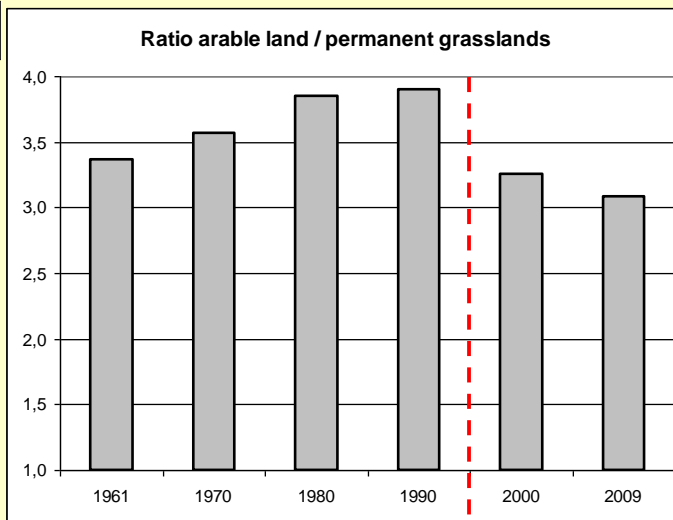
Official price of AL 1992 (CZK/m²)



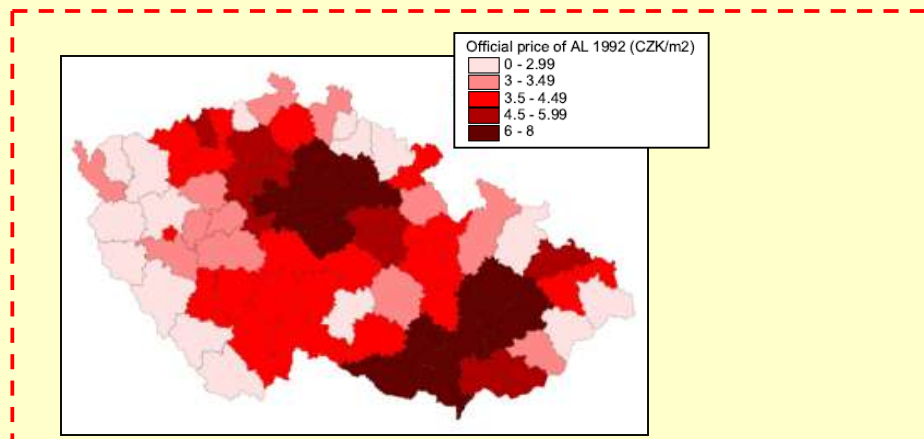
B. Changing spatial distribution of grasslands (1960–2008)



1961–1990



1990–2008



B. Changing spatial distribution of grasslands (1960–2008)

Variability / differentiation in occurrence of grasslands:

Coefficient of variation (standard deviation / mean * 100; %; N=76)

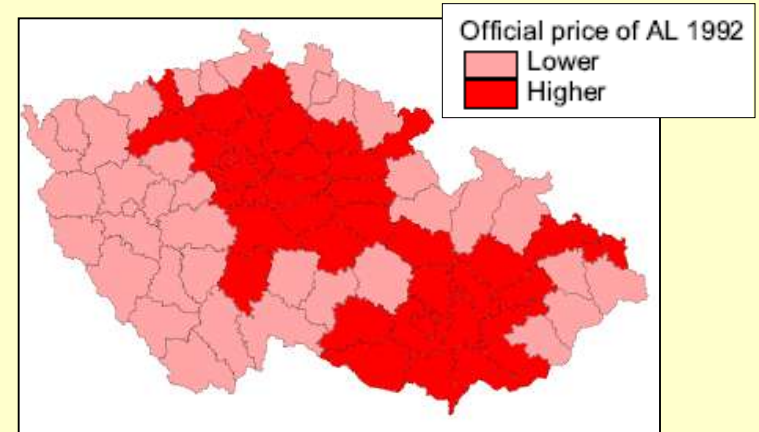
	Share of permanent grasslands (%)	Arable land / permanent grasslands ratio
1961	45,13	81,80
1970	46,77	89,68
1980	50,33	99,21
1990	51,74	103,97
2000	57,73	112,36
2009	57,16	113,97

B. Changing spatial distribution of grasslands (1960–2008)

Influence of natural conditions:

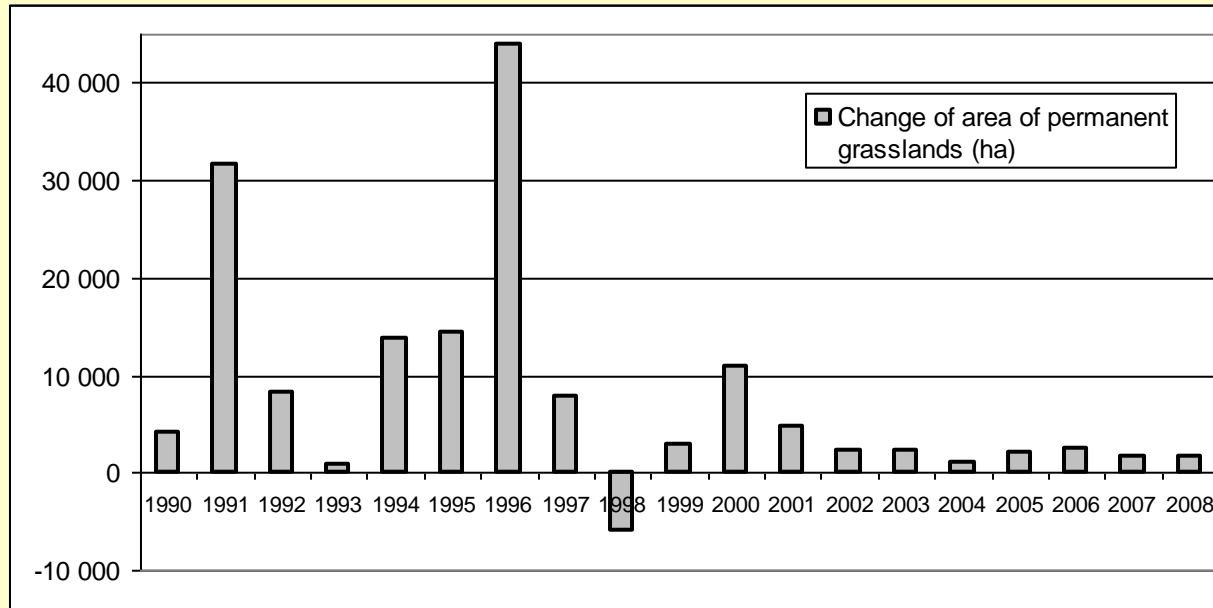
Occurrence of grasslands in districts with Lower (N=38) and Higher (N=38) Official Price of agricultural land (OP)

Official Price of agricultural land (OP)



	Share of permanent grasslands on total area (%)			Ratio arable land / permanent grasslands		
	Lower OP	Higher OP	Difference L-H	Lower OP	Higher OP	Ratio H/L
1961	15,84	8,86	6,98	2,16	6,01	2,78
1970	14,89	8,11	6,78	2,27	6,46	2,85
1980	13,83	7,34	6,49	2,44	7,06	2,89
1990	13,45	6,93	6,52	2,43	7,36	3,03
2000	15,93	7,36	8,57	1,88	6,86	3,65
2009	16,44	7,62	8,82	1,77	6,49	3,67

C. Grassing-over in the period of transformation (1990–2008)



Growth of area of permanent grasslands after 1990:

According to cadastral statistics (1990–2008): **151.409 hectares**

(= 18 % of grasslands from 1990 = 2 % of the area of the Czech Republic)

According to CORINE CLC (1990-2006): **448.040 hectares**

(= 177 % of grasslands from 1990 = 6 % of the area of the Czech Republic)

C. Causes of grassing-over after 1990

- **1. Economy**

- Agricultural crisis, slump in agricultural production

Reasons for this crisis / slump:

- Liberalisation of the market – price liberalisation, growing imports from the West, decreasing exports to the East
- Dismantling of the excessive socialist (1948–90) system of agricultural supports and subsidies
- Privatisation of farms, restitution of land – sometimes unsuccessful, leading to many bankruptcies, etc.

- **2. Policy**

- Supports for grassing-over and maintenance of grasslands

- Grassing-over: **intended** (managed) x **spontaneous** (succession)

C. Causes of grassing after 1990: Economy

Areas under major farm crops (1990–2008, hectares)

	1990	1995	2000	2005	2008
Cereals (total)	1 652 169	1 581 341	1 647 508	1 593 487	1 552 717
Potatoes	109 664	78 045	69 236	36 073	29 788
Sugar beet	118 813	93 654	61 574	65 570	50 380
Rape	105 102	252 285	325 338	267 160	356 924
Perennial fodder crops on arable land	505 381	464 275	417 008	220 918	188 245
Annual fodder crops on arable land	594 526	408 219	308 244	270 963	217 916

Livestock (1990–2008, thous. units)

	1990	1995	2000	2005	2008
Cattle (total)	3 360	1 989	1 582	1 374	1 363
Pigs	4 569	4 016	3 594	2 840	1 971
Poultry	33 278	27 875	32 043	25 736	26 491
Sheep	430	134	90	148	183

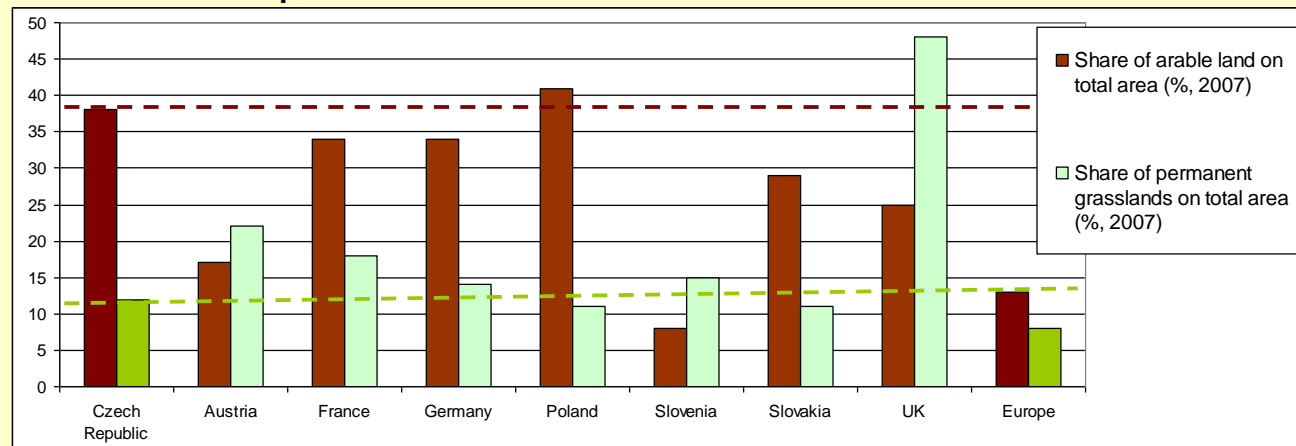
C. Causes of grassing after 1990: Economy

Balance of foreign trade with selected agricultural products (1990–2008, export–import)

	1990	1995	2000	2005	2008
Wheat (thous. tonnes)	27	802	318	748	869
Barley (thous. tonnes)	0	46	-80	257	115
Potatoes (thous. tonnes)	96	-81	-4	-131	-41
Rape (thous. tonnes)	-3	168	264	118	360
Sugar (thous. tonnes)	60	5	61	116	64
Milk (mil. litres)	1 393	731	480	298	128
Beef meat (thous. tonnes live weight)	36	8	-1	3	31
Pork meat (thous. tonnes live weight)	14	-12	-11	-87	-146
Poultry meat (thous. tonnes live weight)	22	-2	-9	-22	-54
Eggs (millions of eggs)	162	46	11	-192	-604

C. Causes of grassing after 1990: Policy

- Why to support grassing-over:
 - **Environment:** to decrease the intensity of land use; to decrease the excessive share of arable land
to improve biodiversity; to prevent floods and water erosion
 - **Economy:** to maintain agriculture in worse natural conditions; to support rural development



- Three basic forms of supports of grassland in the Czech Republic:
 - Grassing-over
 - Maintenance of grasslands
 - Grasslands in Less Favoured Areas (LFA)

C. Policy: Timeline



C. Policy: Grassing-over

Subsidies for grassing-over on arable land – selected years and indicators

Year	Programme, tool, measure, act	Area affected (hectares)	Subsidies (mil. EUR)
2000	Ministry of Agriculture of the Czech Republic Acts 24/1999 and 344/1999	6 841	1,5
2001		3 185	1,0
2002	Ministry of Agriculture of the Czech Republic Acts 505/2000 and 500/2001	1 266	0,4
2003		2 000	0,5
2004	Horizontal Rural Development Plan 2004–6	5 760	1,6
2005	Grassing over on arable land 230 EUR / hectare for five years	14 600	4,0
2006	Only in worse natural conditions (max. cca 1/3 of Czech arable land)	32 560	9,0
2007	Rural Development Programme 2007–13 Grassing over on arable land From 270 to 374 EUR / hectare for five years Only in worse natural conditions	51 140	14,0

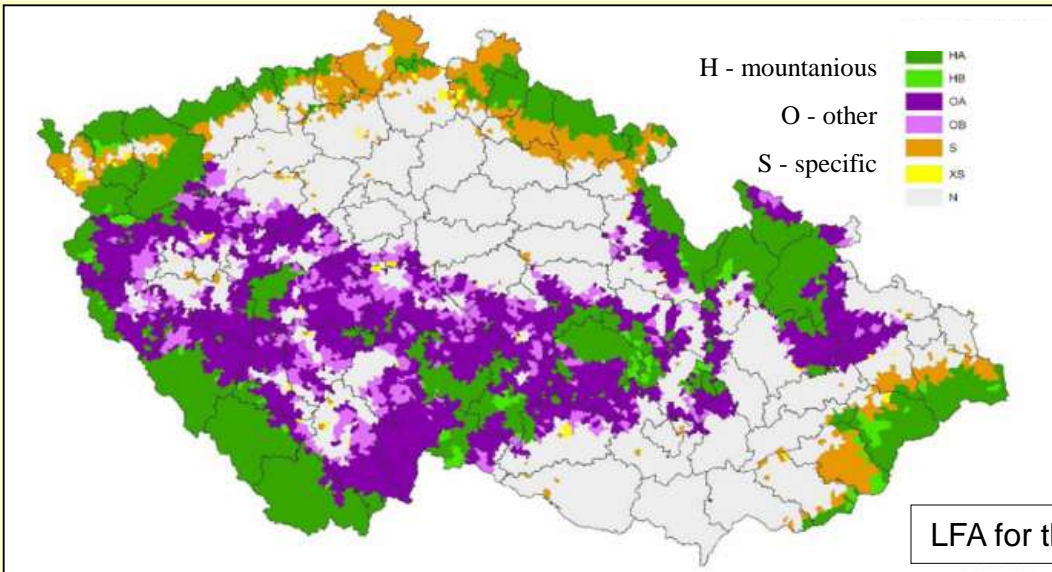
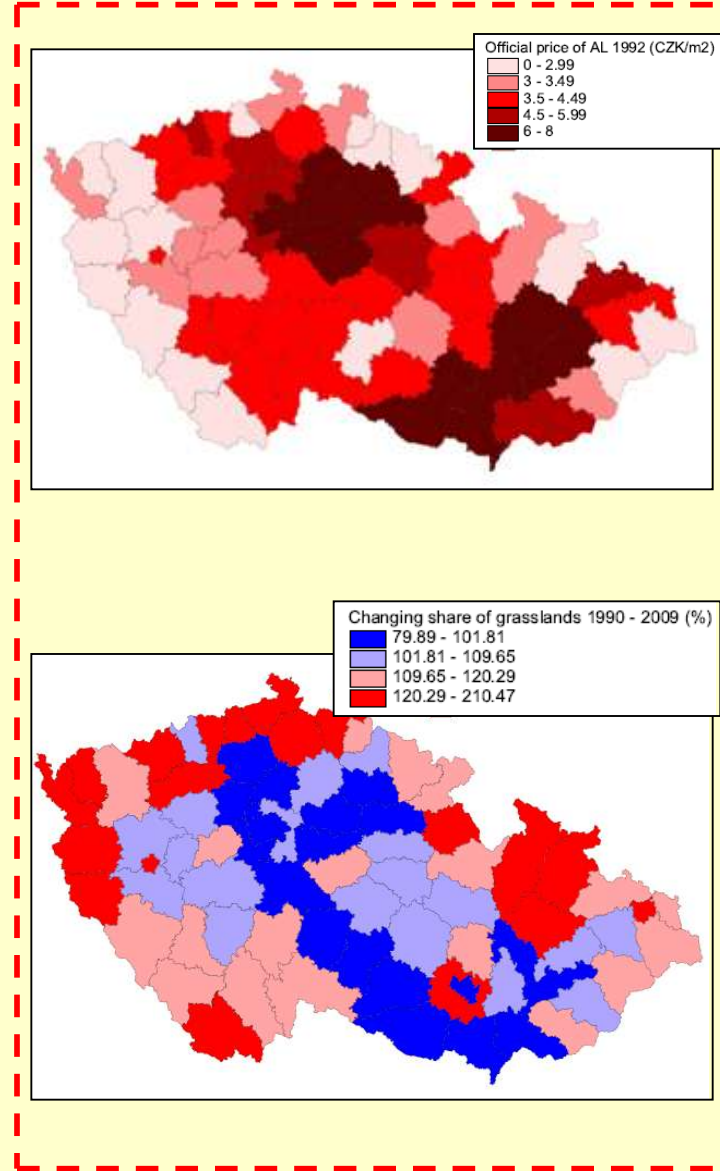
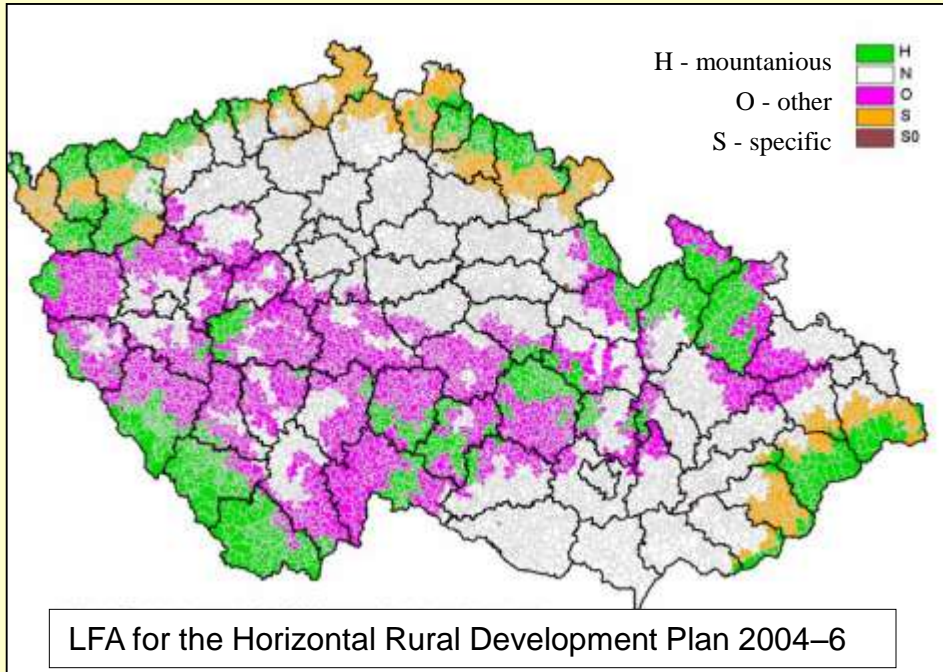
1 EUR = 27 CZK; total area of Czech arable land: ca 3.000.000 hectares (38 % of total Czech area)

C. Policy: Maintenance of grasslands

Subsidies for maintenance of grasslands – selected years and indicators

Year	Programme, tool, measure, act	Area affected (thousand hectares)	Subsidies (mil. EUR)
1996	Ministry of agriculture of the Czech Republic Maintenance of landscape in a cultural state	450	54
1997	(mowing and grazing grasslands in worse natural conditions)	524	62
1998			
1999	Ministry of agriculture of the Czech Republic Maintenance of landscape in a cultural state		
2000	(for all agricultural land, not specifically for grasslands; in 2000 favoured grasslands in worse natural conditions)		
2001		462	30
2002	Ministry of agriculture of the Czech Republic Acts 505/2000 and 500/2001 Maintenance of grasslands through grazing	503	31
2003		536	33
2004	Horizontal Rural Development Plan 2004–6 Maintenance of grasslands	723	65
2005	From 60 to 161 EUR / hectare	693	68
2006	For all grasslands (max. 900.000 hectares)	698	69
2007	Rural Development Programme 2007–13 Maintenance of grasslands From 75 to 417 EUR / hectare For all grasslands (max. 900.000 hectares)	748	76

C. Policy: Grasslands in LFA



C. Policy: Grasslands in LFA

Subsidies for maintenance of grasslands in LFA – selected years and indicators

Year	Programme, tool, measure, act	Area affected (thousand hectares)	Subsidies (mil. EUR)
2001	Ministry of Agriculture of the Czech Republic, Act 505/2000		
	LFA Mountainous (13 % of AL, 96 to 107 EUR / ha of grass.)		
	LFA Other (38 % of AL, 37 to 93 EUR / ha of grass.)	745	65
	LFA Specific (5 % of AL, 30 to 37 EUR / ha of grass.)		
	LFA with environment. constraints (4 % of AL, 20 to 78 EUR / ha of grass.)		
2002	Ministry of Agriculture of the Czech Republic, Act 500/2001		
	LFA Mountainous (13 % of AL, 104 to 115 EUR / ha of grass.)	755	61
	LFA Other (38 % of AL, 44 to 100 EUR / ha of grass.)		
2003	LFA Specific (5 % of AL, 37 to 44 EUR / ha of grass.)		
	LFA with environment. constraints (4 % of AL, 28 to 85 EUR / ha of grass.)	750	56
2004	Horizontal Rural Development Plan 2004–6	721	97
2005	LFA Mountainous (15 % of AL, 126 to 147 EUR / ha of grass.)		
	LFA Other (30 % of AL, 89 to 110 EUR / ha of grass.)	707	91
2006	LFA Specific (7 % of AL, 108 EUR / ha of grass.)	721	103
2007	Rural Development Programme 2007–13		
	LFA Mountainous (15 % of AL, 134 to 157 EUR / ha grass.)	761	104
2008	LFA Other (30 % of AL, 94 to 117 EUR / ha grass.)		
	LFA Specific (5 % of AL, 91 to 114 EUR / ha grass.)	764	100

Questions for further research

- To what extent is grassing-over influenced by **economy x policy**?
 - Natural x institutional driving forces
 - Intended x spontaneous grassing-over
 - Behaviour of actors, decision-making process and context
- To what extent is the **spatial distribution** of new grasslands influenced by the policies?
 - What are the economic and environmental consequences of grassing over in particular localities?
- How **effective** are the policies?
 - Economic, environmental, regional efficiency
 - How could we improve them?

Thank you for your attention!

