

Agricultural development chances in valley situations with intensive groundwater use

(Murtal from Graz to Radkersburg)

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Agricultural development chances in valley situations with intensive groundwater use

Disposition

- Introduction
- Economic approach for groundwater protection
- Legal framework
- Forecast for Austria's agriculture until 2015
- Agriculture and groundwater protection in the project area
- Perspectives for the agricultural development in the Graz to Radkersburg area

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Introduction

The Austrian National Strategy Plan for the development of the rural area aims at a

- multifunctional,
- sustainable and
- competitive performance of Austria`s agriculture and forestry.

(BMLFUW, 2006)

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Introduction

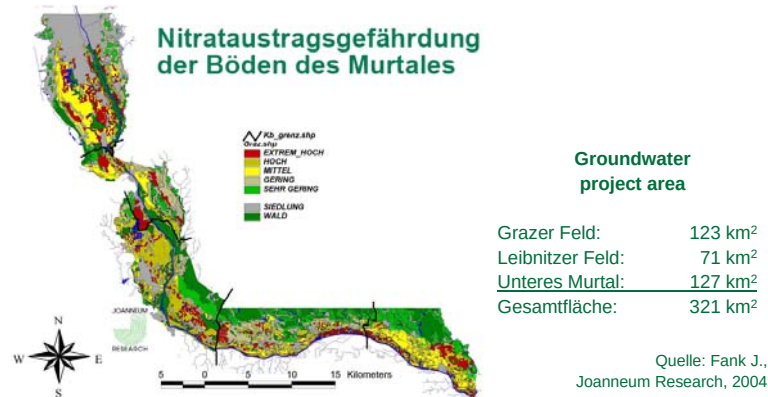
The measures for the development of rural areas for the new period promote

- specific nature protection measures and/or
- the extensive and environmentally friendly management, especially those measures, which particularly preserve soil, water and climate.

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Agriculture and groundwater protection in the project area



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Economic approach for groundwater protection

Traditionally there are direct regulations in the form of environmental laws and rules.

The utilisation of drinking water resources is very complex.

The qualitative and quantitative scarceness cannot always be strictly separated. Insufficient quality of water can lead to quantitative scarceness, if uncontaminated water must be added. Main problems are in nitrate contaminated regions.

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Economic approach for groundwater protection

In Austria groundwater is common property and only minor utilisation is permitted without grant.

On locations with intensive groundwater use only a restricted utilisation of arable land is possible, in order to reach the drinking nitrate limit of 50 mg.

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Legal framework

The main principle of water utilisation is sustainability. With the WRG amendment 2003 the legal framework for the realisation of the WRRL was created.

In all of Austria the currently applied Action Programme 2003 is the centerpoint for the realisation of the EU Nitrat Guideline.

WRG ... law for the utilisation and the prevention of pollution of water
WRRL .. is an framework of guidelines for the protection of water issued by the EU.

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Legal framework

In addition to the Nitrate Action Programme 2003 there is the Grundwasser-Schwellenwert-Verordnung, which defines the limit of the tolerated nitrate level of 45 mg in groundwater.

On the basis of supplementing regional programmes (§ 33f WRG) in areas, in which nitrate levels are not only exceeded temporarily, a multi level procedure is implemented (prospective action areas).

Utilisation regulations in water protection areas (§ 34f WRG) can cause additional regulations or prohibitions.

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Amendment to the existing protected area law for the Leibnitzer Feld area – excerpt

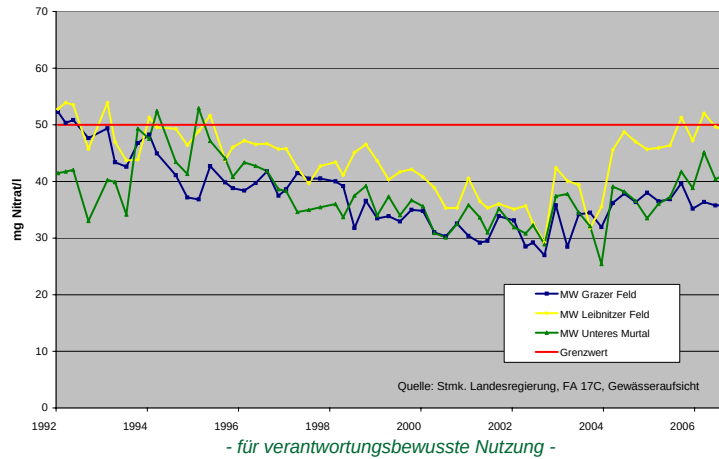
- N-fertilisation to corn and root crops:
 - mineral fertiliser: not before 10 May
 - liquid manure: not before 20 May
- in autumn N-fertilisation for winter intermediate crops is forbidden
- limits for the N-fertilisation to corn:

Predominant soil type according to Ministry of Finance soil grading:	kg N/ha
clayey sand on gravel, grade 3, 4 and 5D, sand, sand with a low share of clay, clay with significant share of sand on gravel (these are kinds of soil which are prone to leaching nitrate)	115
clayey sand, clay with a significant share of sand	160
sandy clay, clay, clay on potter's clay	170

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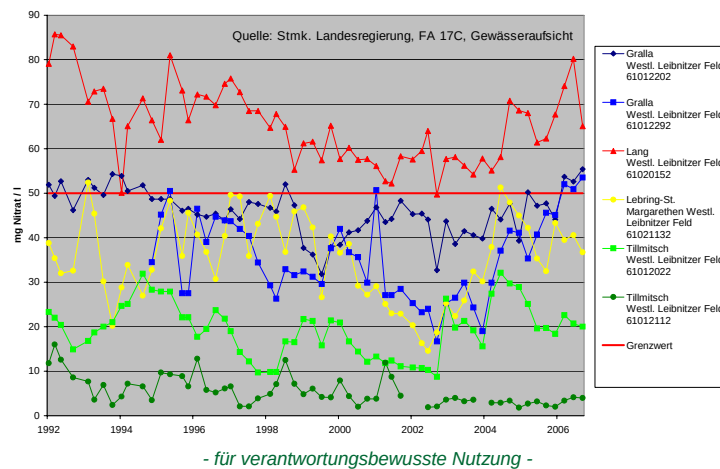
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Water quality evaluation control point data in project area



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Water quality evaluation control point data in Western Leibnitzer Feld area



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Austria's agricultural performance forecast until 2015

There are continuous records about Austria's agricultural structure.

The underlying hypothesis is based on the assumption that the number of farms and people employed in this sector is declining.

In order to determine the potential contamination of waters caused by farming until 2015 extrapolations were carried out.

(Sinabell and Schmid, WIFO/Boku, Vienna)

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Austria's agricultural performance forecast until 2015

Results of these computations show a decrease of water contamination, particularly through the agrarian reform 2003, as

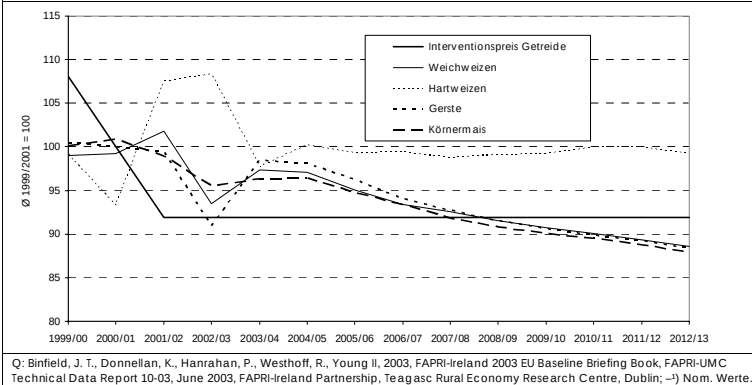
- incentive for production will significantly decrease
- milk production will go up significantly although livestock as a whole is decreasing
- alternative production forms such as organic farming will use at least the same acreage if not even more

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Austria's agricultural performance forecast until 2012

Abbildung 1: Prognose der Preisentwicklung¹⁾ bis 2012 für die EU laut FAPRI "Baseline Szenario" – Pflanzlicher Bereich, WIFO, 2004

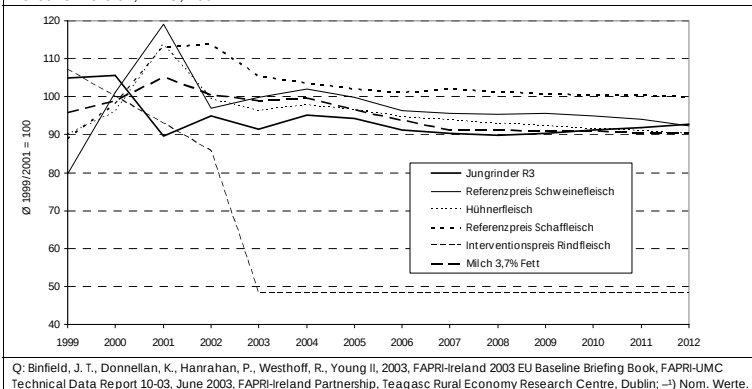


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Austria's agricultural performance forecast until 2012

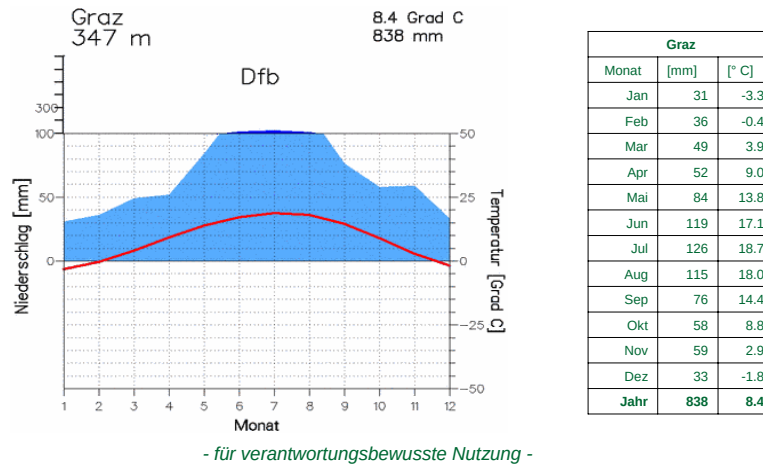
Abbildung 2: Prognose der Preisentwicklung¹⁾ bis 2012 für die EU laut FAPRI "Baseline Szenario" – Tierischer Bereich, WIFO, 2004



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Regional agriculture – climatic diagram



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Regional agriculture – status quo

- There is a general declining trend - regional differences are given
- criteria for the regional differences in the project area:
 - high density of biogas plants
 - intensive pig production, in Leibnitz and Radkersburg
 - extremely high land lease prices and/or very strong demand for arable land

Conclusion: As a result this leads to the intensive use of the agricultural production areas

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Regional agriculture – biogas plants in Styria

Biogasanlagen in der Steiermark



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Austria's agriculture – utilisation for arable crop

	Anbaufläche (in ha)	Anbaufläche (in % zur Gesamtfläche)	Durchschnitts- erträge (in dt/ha)
Hartweizen	14.914	1,73	40,6
Weichweizen	269.344	31,19	51,4
Roggen	42.182	4,88	38,2
Wintergerste	72.608	8,41	54,8
Sommergerste	117.698	13,63	40,4
Gerste gesamt	190.307	22,04	45,9
Hafer	30.020	3,48	42,5
Triticale	39.101	4,53	50,3
Raps	28.278	3,27	29,9
Körnererbse	35.542	4,12	25,1
Sojabohne	21.332	2,47	28,3
Sonnenblume	26.623	3,08	27,0
Körnermais	165.942	19,22	103,1
Gesamt	863.584		

Quelle: Marktbericht der Agrarmarkt Austria, 2006

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Austria's agriculture – utilisation for corn

Anbaugesbiet	Anbaufläche/ha (lt. KPA)	Anbaufläche (in % der Gesamtfläche 2006)	Trockengewicht (in dt/ha)
Wien	148	0,10	80,0
Niederösterreich	46.409	29,42	91,1
Burgenland	19.603	12,43	85,4
Oberösterreich	38.823	24,61	94,4
Steiermark	38.196	24,21	104,4
Kärnten	14.416	9,14	68,7
Salzburg	66	0,04	104,6
Tirol	53	0,03	73,3
Vorarlberg	42	0,02	78
Gesamt 2006	157.756		92,4
Vergleich 2005	165.942		103,1

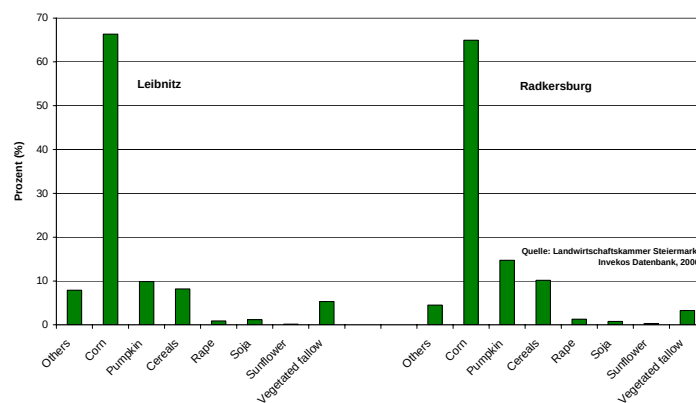
Quelle: Marktbericht der Agrarmarkt Austria, 2006

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Regional agriculture – utilisation for arable crops

Anteil der Ackerkulturen in Leibnitz und Radkersburg



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Austria's agriculture – pig production

Pig livestock and pig producers in the Austrian provinces (x 1.000)

	B	K	NÖ	OÖ	S	ST	T	V	W	Ö
1980	171,6	236,3	1.277,9	1.025,9	49,0	817,3	85,6	32,7	9,9	3.706,2
1990	140,5	200,1	1.151,4	1.123,9	32,9	961,0	57,7	19,0	1,5	3.688,0
1995	125,6	197,5	1.090,8	1.179,8	26,7	1.022,5	43,8	18,6	0,9	3.706,2
2000	84,4	174,2	970,4	1.191,5	15,4	867,8	28,4	15,2	0,7	3.347,9
2005	71,7	163,7	879,8	1.144,3	12,4	863,2	18,7	15,6	0,2	3.169,5

pig producers in the Austrian provinces

	B	K	NÖ	OÖ	S	ST	T	V	W	Ö
1980	15.838	19.619	51.120	41.020	6.593	52.982	12.427	2.757	107	202.463
1990	9.024	14.858	33.978	30.213	4.623	39.078	9.299	1.834	39	142.946
1995	5.632	12.290	25.426	24.249	4.149	31.292	7.552	1.470	20	112.080
2000	3.175	9.421	17.643	17.496	2.765	22.218	5.285	1.006	11	79.020
2005	1.447	7.107	11.734	12.374	2.171	14.970	3.797	752	4	54.356

Quelle: Grüner Bericht 2006

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Regional agriculture – pig production

Pig livestock in Styria

District	Pig livestock	
	(Number)	(Percentage)
Feldbach	252.213	31,49
Leibnitz	175.518	21,92
Radkersburg	108.759	13,58
remaining 14 districts	264.372	33,01
Styria total	800.862	100,00

Quelle: Landwirtschaftskammer Steiermark,
Invekos Datenbank, 2006

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Perspectives for the development of farming in the Graz to Radkersburg area



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Perspectives for farming with intensive groundwater use in the Graz to Radkersburg area

1. Pig production
2. Energy production
3. Vegetable production
4. Organic farming (organic offensive of the Styrian Chamber of Agriculture and Forestry)
5. Contract between farmers and suppliers

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Perspectives for the farming in the Graz to Radkersburg area – pig production

Pig breeding, as a prevailing branch of farming in Leibnitz and Radkersburg, will utilise big portions of land also in the future.

Problem: temporal and local distribution of liquid manure

Solutions: Creation of tanks for liquid manure. Fertilisation of the growing corn plant and simultaneous reduction of mineral fertilisation. We plan to dehydrate liquid manure and apply it then (project has been launched).

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Perspectives for farming in the Graz to Radkersburg area – energy production

Farming stands at the beginning of transition from farmer to the energy producer. Production of biogas, biofuels and the production of sources of energy for thermal utilisation.

Problem: Biogas production causes additional amounts of liquid manure. Corn monocultures are becoming the predominant field crop, especially through silo corn production.

Solution: Growing perennials as energy plants (Miscanthus, Canarygrass etc.)

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Perspectives for farming in the Graz to Radkersburg area – vegetable production

Growing vegetables in the Grazer Feld area will be of great importance also in the future.

Problems: Highly intensive fertilisation is needed. The area is a sensitive groundwater resource because nitrate easily gets down unfiltered into the groundwater. The soil there is prone to leaching nitrate.

Solutions: Development of alternative fertilisation methods, (CULTAN procedure) etc.

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Perspectives for farming in the Graz to Radkersburg area – contract between farmers and suppliers

The option of the contractual agreement between farmers and water suppliers is a supporting instrument to safeguard optimal water quality.

Problem: Water suppliers are only reluctantly prepared to pay a compensation for the restricted utilisation of arable land.

Solution: Willingness of both sides involved to find an agreement.

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