Thesis of doctoral (PhD) dissertation

CHANGES OF GRASSLAND FARMING IN THE COUNTY OF SZABOLCS-SZATMÁR-BEREG BETWEEN 1990 AND 2005

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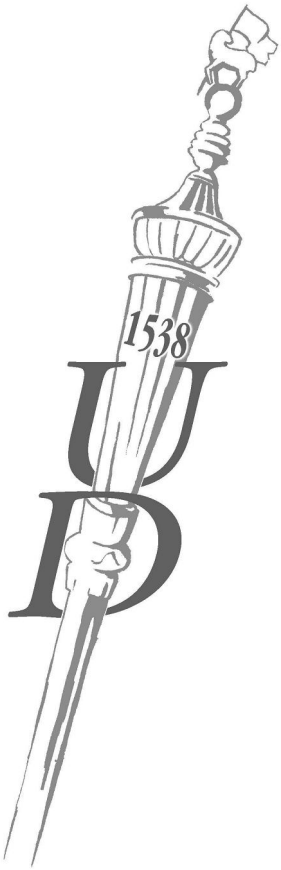

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1. AIMS OF THE RESEARCH

Remarkable alterations had come off in the Hungarian agriculture and in the grassland husbandry due to the social and economical changes, the preparation for EU membership and the EU accession passed off in the last decade of the 20th century. Regarding the structure of the Hungarian agriculture, it is the grassland husbandry that lost importance to the greatest extent despite its high territorial rate, its inherent potential and untapped possibilities. New private companies and joint ventures started to run in the agriculture. Under the privatization the animal and arable land owners shifted, and the animal keepers remained without land. The grasslands fell apart, their utilization ceased due to the lack of skill and of the proper economic initiations, the traces of which are still perceptible.

The area of our grasslands is becoming smaller year by year, the proportion of the lands exploited is around or below 50 % according to experts' opinion and the figures. The yields are much lower than the level expected because of the scarcity of fertilization and irrigation. Grassland husbandry tends to the extensification but it needs to be revised whether the extensive exploitation forced should be maintained under any circumstances in any area.

The cattle and sheep stock depending on the grasslands declined remarkably after the change of regime. This downside was strictly descending in case of cattle stock, while the change of sheep stock was wavering.

Purpose of my research activity was to survey the changes occurred in micro regions of Szabolcs-Szatmár-Bereg County and to compare the local situation with the regional and national ones. My guiding principle was to analyze and to collate the data came from the statistics and own survey, and to draw conclusions based on the results. My research activity covers the following fields:

- My main aims related to grasslands:
  - I would like to collect – from own resources and from the Hungarian Central Statistical Office – the area and production data and the factors influencing them. I would like to analyze the size of the farms, the size of the grasslands at the different types of farms, the property relations and reveal the changes in the property relations and grass usage. I would also like to analyze and evaluate the agronomical circumstances of the grasslands. The success and effects of agricultural-environmental projects on the sector should also be examined. After analyzing and evaluating the data I would make conclusions and proposals regarding the grass management of the county of Szabolcs-Szatmár-Bereg.

- My main aims related to animal husbandry and grass usage:
  - I set as an aim to collect and analyze the stock data of the animals that can mostly connected to grass. I give an overall view about the states of animal husbandry and grass usage based data from representative farms from Szabolcs-Szatmár-Bereg county and data from the Hungarian Central Statistical Office. I also put emphasis on the changes of grass production and grass usage. I would like to introduce and analyze the changes in the cattle and sheep stock after the change of the regime, the changes in the number of the cattle and sheep keeping farms and animal concentration. Try to find relations among the different factors affecting the size of the animal stock. I would like characterize the cattle and sheep keeping, development plants and point out the stage of the general usage of the grasslands.

In accordance with the thesis I would like to make analyzing evaluation of the agronomical, agricultural-environmental aspects of grass management and grass usage. I would also like to make proposals on the future developments of the sector and the factors that may facilitate the development.

2. MATERIALS AND METHODS

Collection of data

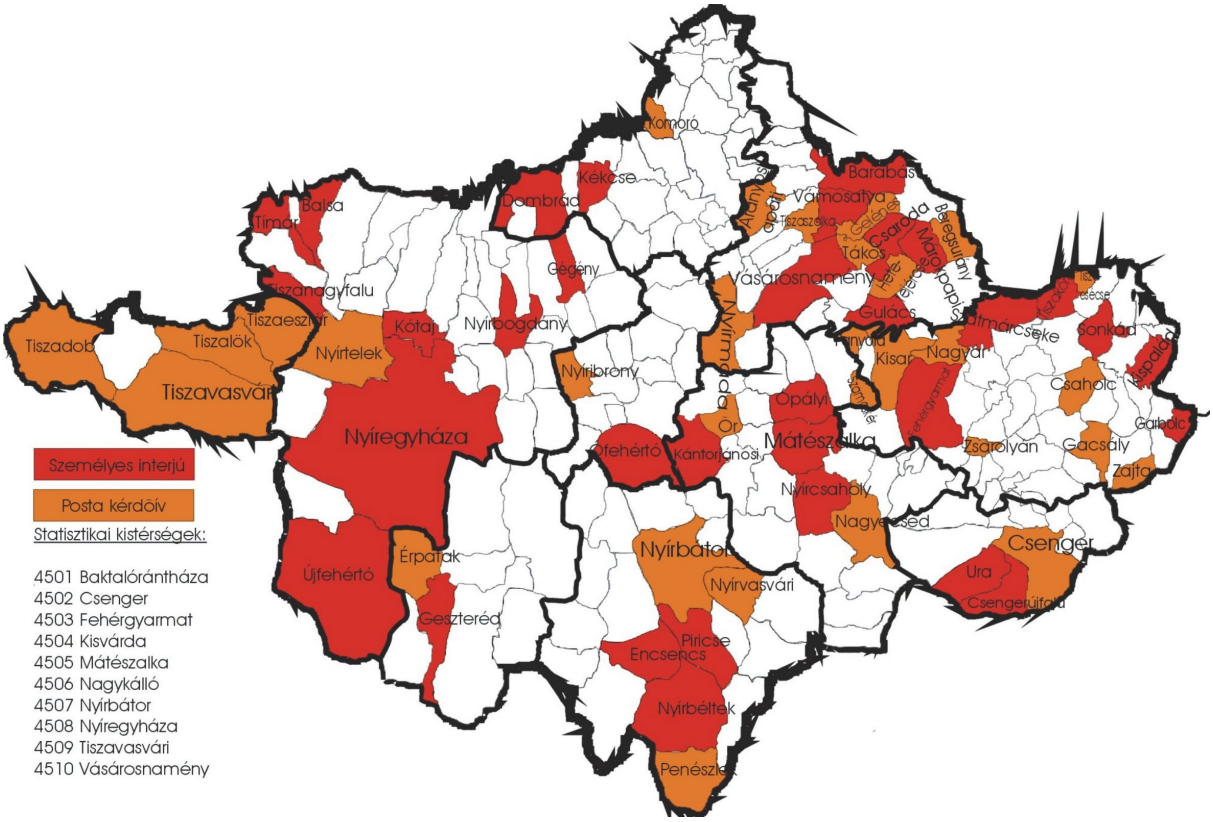
Data were gained from the database of the General Statistic Bureau, of the Department of Agricultural and Rural Development, Agricultural and Rural Development Bureau, and from own survey.

Questionnaires were worked out to survey and to analyze the opinions of grassland farmers. Some part of the questionnaires was pass to the farmers by mail. In additional depth interview method was applied. Results of the survey were compared to the national, regional and county side data. SWOT analysis regarding to the grasslands and grassland farmers was made up.

Surveying

The survey and the depth interview were performed in the summer of 2003. The data of the farmers were estimated anonymously.

The farmers were selected randomly to represent the all county. The examined settlements could be seen in Figure 1.



Source: Own edition

Figure 1: Places and locations of the survey, 2002

Together 62 settlements were sampled, on 33 settlements I made depth interviews (marked with red), from 29 settlements questionnaires were collected by post (marked with orange).

Database given from the Local Agricultural and Rural Development Bureau consist of 5067 registered farmers out of which 4746 farmers have grasslands. 1030 farmers have 5 ha or more grassland and they constitute the base database of the survey and depth interview.

68 questionnaires were gathered after I received them by post, which is 6.6% of the base abundance. 60 of them were estimated, which is 5.8% of the base abundance (Table 1).

Depth interview

50 depth interviews were accomplished, also see in Table 1.

Evaluation

Mathematical statistical calculations (means, variation, correlation and regression analysis) were completed using SPSS and Microsoft Excel applications.

Main colors of the tables and figures:

Light blue=own database

Light green=statistical, Local Agricultural and Rural Development Bureau data

Data were collected mostly from 1996 to 2005.

Table 1: Number of the surveyed farms, the estimated questionnaires and the interviews in the county of Szabolcs-Szatmár-Bereg (2002)

Grassland area of the farms (ha)	Base data (number of the registered farms by the FVM Bureau)	Posted questi-onnaires (piece)	Returned questi-onnaires		Non esti-mated (piece)	Inter-views (piece)	Estimated questionnaires	
			(piece)	(%)			(piece)	(%)
5-10	402	80	17	21.3	8	11	20	18.2
10.1-20	283	60	13	21.7	0	8	21	19.1
20.1-50	161	60	20	33.3	0	16	36	32.7
50.1-100	25	25	9	36.0	0	7	16	14.5
over 100	33	33	9	27.8	0	8	17	15.5
Total	**904**	**258**	**68**	**100**	**8**	**50**	**110**	**100**

Source: own database

3. MAIN RESULTS OF THE THESIS

3.1. The farming circumstances of the farms examined

Among the farms examined more than 57% are private farms and about 14% of these operate as joint ventures, 32 farmers (29%) did not give answer to this question (Table 2).

Table 2: Number and type of the estimated farms (2002)

Farm type		Farms	
		number (piece)	proportion (%)
Joint ventures	Ltd.	10	9.1
	Public limited-liability company	2	1.8
	Public Company Limited by Guarantee	1	0.9
	Co-operative	2	1.8
Private companies	Individual farmer	30	27.3
	Private household farmer	22	20
	Individual contractor	11	10
Did not answered		32	29.1
Total		**110**	**100**

Source: own database

Among the private companies (63, 80.8% of those who gave answer) and the other farmers most of them (30/110 farmers) are Family Farmers. As Private Household Farmers 22 people, as Individual Contractors 11 people operated during the survey. Among those who have a

legal background (15, 19.2% of those who gave answer) most of them operate within the framework of Ltd. and Stock-companies and Co-operative farms could be mentioned.
Most of the farms belong to the category of 0-100 ha, their overage territory is 43.6 ha, the overage size of their grassland was 22 ha, but they used only the 20% of the grassland examined.
I also surveyed the machine supply of the farms and it can be said that the grassland machinery supply is deficient or old. It might be interesting that the supply of the machines that can be used for maintaining grass (for example windrower) is deficient. The defective supply of the grassland machinery also contributes to the low level of growing and usage of the grass sector.

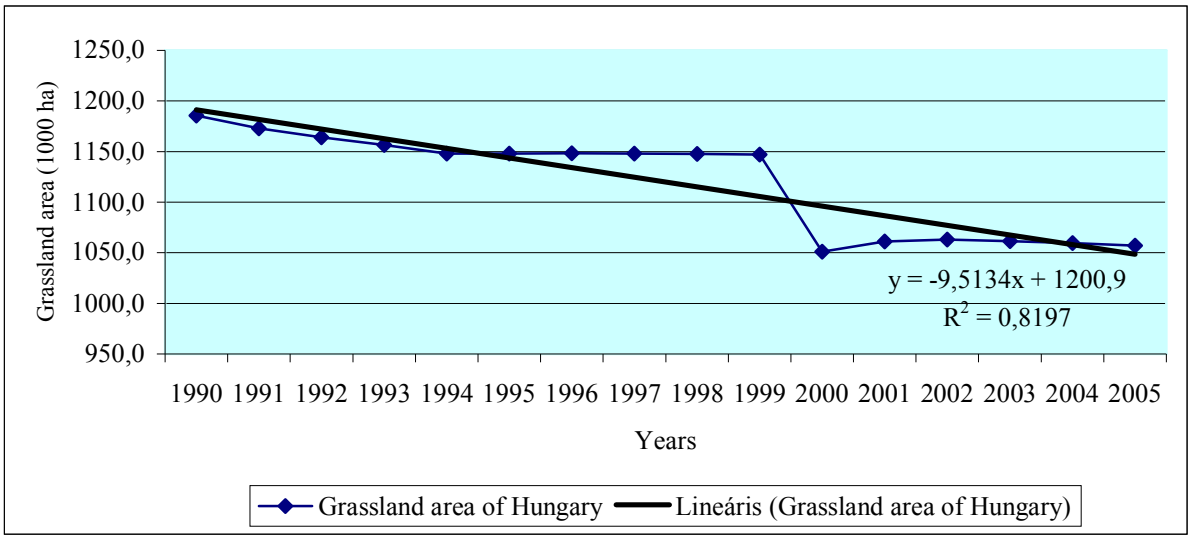
3.2. Agro conditions of the grasslands

Szabolcs-Szatmár-Bereg county has large grasslands. Bigger grasslands are only in Bács-Kiskun, in Hajdú-Bihar and in Borsod-Abaúj-Zemplén county. Proportion of the grasslands from the agricultural area is 17.1%, which is lower than the national (18%) proportion (Table 3).
Between 1990 and 2005 the size of the grassland reduced significantly, with 128700 hectares that is 11%. The reduction was recognizable in the Northern Great Plain Region and in Szabolcs-Szatmár-Bereg county as well. The reduction of the grassland is shown in Figure 2 in case of Hungary and on Figure 3 in case of Szabolcs-Szatmár-Bereg county.

Table 3: Land area of Hungary, the Region of Northern Great Plain and the County of Szabolcs-Szatmár-Bereg, ha (2005)

Denomination	Total area		Agricultural area		Grassland	
	(thousand ha)	proportion from the national %	(thousand ha)	proportion from the national %	(thousand ha)	proportion from the national %
Hungary	9 303.4	100	5 863.9	100	1059.6	100
County of Szabolcs-Szatmár-Bereg	625.8	6.7	392.1	6.7	67.1	6.3

Source: KSH 2006



Source: Based on KSH 1994; 1995b; 1996; 1997; 1998; 1999; 2000a; 2001; 2002a; 2003; 2004; 2005; 2006; KSH Szabolcs-Szatmár-Bereg megyei Igazgatósága 1990; 1991; 1992; 1993; 1994; 1995; 1996; 1997a,b; 1999; 2000; 2001; 2003 and own edition

Figure 2: Changing of Hungary's grassland area, 1000 ha (1990-2005)

In the region in comparing with the data of 1994 we can realize that the reduction decreased to 9.2%. In 2005 the reduction of the grassland in the county of Szabolcs-Szatmár-Bereg was recognizable, it was 15.4% (12200 hectares) and this reduction was over the country's average. The reason of the reduction was due to the road buildings, growth of settlements and plants and factories.

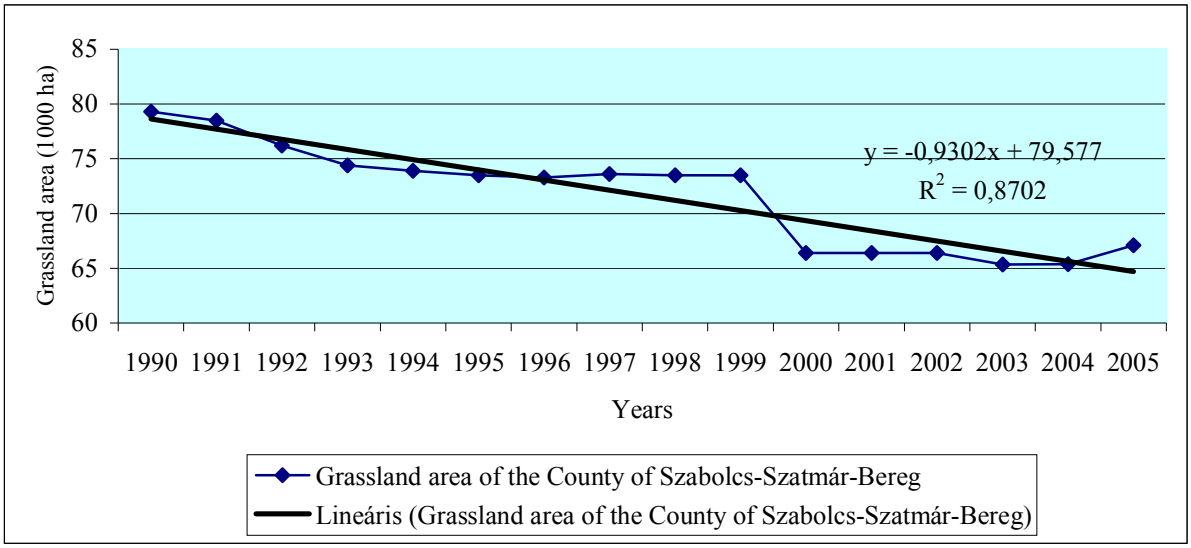


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Figure 3: Changing the grassland area of the County of Szabolcs-Szatmár-Bereg, 1000 ha (1990-2005)

In my opinion the reduction – based on the statistics data – was mainly because of the growing land need of plants, factories and settlements and the road systems built. These investments withdrew land that could be built up easily around the settlements. The idea is supported by the fact that meanwhile in the whole country the size of the withdrawn land was increased by 47.5% between 1990 and 2005, in the county the size of the withdrew land increased by 71.4%.

29% of the grassland of the Szabolcs-Szatmár-Bereg county is meadow (19023.4 hectares), 71% is pasture (46665.5 hectares) (see in Table 4). 57.2% of the whole grassland of the county can be found in the Nyíregyháza, Fehérgyarmat and Vásárosnamény micro regions. The less grassland can be found in the Baktalórántháza micro region.

Table 4: Grassland area of the statistical regions in the County of Szabolcs-Szatmár-Bereg registered by the Land Registry, ha (2001)

Region code	Micro region	Pasture		Meadow		Total grassland area	
		ha	%	ha	%	ha	from the County's total %
4501	Baktalórántházai	1276.4	2.7	724.2	3.8	2000.6	3.0
4502	Csengeri	2009.8	4.3	430.7	2.3	2440.5	3.7
4503	Fehérgyarmati	11962.2	25.6	249.6	1.3	12211.8	18.6
4504	Kisvárdai	3502.4	7.5	1877.8	9.9	5380.2	8.2
4505	Mátészalkai	2414.2	5.2	1298.1	6.8	3712.3	5.7
4506	Nagykállói	1430.6	3.1	1729.5	9.1	3160.1	4.8
4507	Nyírbátori	2937.7	6.3	1974.6	10.4	4912.3	7.5
4508	Nyíregyházai	6737.6	14.4	6759.2	35.5	13496.8	20.6
4509	Tiszavasvári	5121.7	11.0	1407.8	7.4	6529.5	9.9
4510	Vásárosnaményi	9273.0	19.9	2571.9	13.5	11844.9	18
Total grassland area		**46665.6**	**100**	**19023.4**	**100**	**65689**	**100**

Source: Szabolcs-Szatmár-Bereg megyei Földhivatal 2001

I examined the size and rate of the used grassland in accordance with the methodology of the KSH (Central Statistics Bureau). In the rank of the size of the used grassland Nyíregyháza (8829.9 hectares) is followed by Fehérgyarmat and Vásárosnamény. The size of the grassland used is between 1500 and 300 hectares in the Kisvárda, Tiszavasvári, Nyírbátor, Nagykálló and Mátészalka micro regions while the less grassland can be found in the Csenger and Baktalórántháza micro regions.

The sum territory of the lands of the farms examined by questionnaires and depth interviews is 28558.7556 hectares. Table 5 shows the division of the grasslands of the farms.

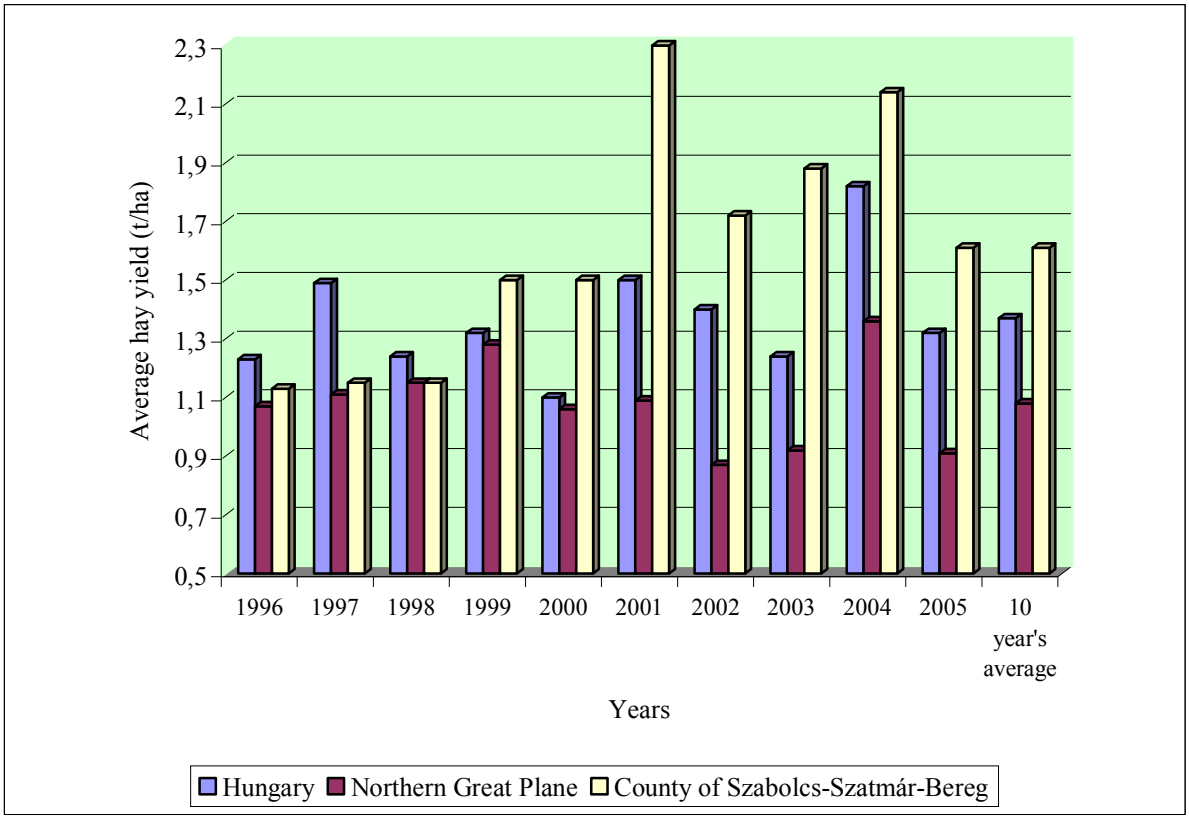
Table 5: Area of the estimated farms by the farm type, ha (2002)

Farm type		Number of the farms	Total area of the farms		Grassland from the total	
			ha	%	ha	%
Private companies	Individual farmer	30	1407.3	4.9	746.6	9.9
	Private household farmer	22	2088	7.3	1185.4	15.8
	Individual contractor	11	1394.3	4.9	442.2	5.9
Joint ventures	Ltd.	10	6644.5	23.3	1372.9	18.3
	Public limited-liability company	2	2642	9.3	803	10.7
	Public Company Limited by Guarantee	1	277	1	187	2.5
	Co-operative	2	11290	39.5	1342.8	17.9
Total		***78***	***25743.1***	***90.2***	***6079.9***	***81***
Did not answered		32	2815.6	9.8	1431.7	19
Altogether		**110**	**28558.7**	**100**	**7511.6**	**100**
%		**-**	**100**	**-**	**26.3**	**-**

Source: own database

In case of the traditionally smaller farms (individual farmers, private household farmers and individual contractor) the overall size is 77.6 ha, and the overall size of the grassland is 37.7 ha. The 31.6% of the examined grassland belongs to this type of farms. The farms with legal background have an overall size of 1390.2 ha, and the overall size of the grassland is 247 ha. These farms (15 pcs) own the 49.4% of the grassland examined. Among the examined 110 farms 97 have own grassland while 55 rent meadow or pasture. The size of the grassland examined is 7511.6 ha that is the 11.3% of the county's while grassland. The average size of the grassland was 68.3% at the farms examined. In the case of own and rented lands the absolute and the average size of the pastures is higher than the meadows. Among the 1100 examined farms 55 (50%) use own lands and 42 (38.2%) farm on own or rented lands while 13 (11.8%) use only rented lands.

Figure 4. shows the average hay yield by years at the examined lands based on KSH data.



Source: Based on KSH 1997; 1998; 1999; 2000a; 2001; 2002a; 2003; 2004; 2005; 2006; KSH Szabolcs-Szatmár-Bereg megyei Igazgatósága 1997a,b; 1999; 2000; 2001; 2003 and own edition

Figure 4: Average hay yield in Hungary, in the Northern Great Plane and in the County of Szabolcs-Szatmár-Bereg, t/ha (1996-2005)

The average hay yield was the highest in the County of Szabolcs-Szatmár-Bereg (1.51 t/ha), while the dispersion of the hay yield was also the highest here (0.41 t/ha). Szabolcs-Szatmár-Bereg County's hay yield exceeded the country's and the regional average as well. We may draw the conclusion that the average yield of Szabolcs-Szatmár-Bereg County was higher in every year examined (with 1 expectation, in 1998 the average yields were equal) than the average yield of the Northern Great Plain Region. The explanation could be the more favourable geographical location and weather conditions.

Based on the National Statistical Bureau's data, between 1996 and 2005 the ration of sum size of the grassland and the harvested grassland in Hungary was between 27.5% and 66.7%, in the Northern Great Plan region it was between 43.9% and 54.3% with a decreasing tendency.

I also examined the yield production of the meadow and pasture. In the case of the grassland examined the total was 12388.1 tons hay and the average is 1.65 t/ha. In case of own grasslands it was 1.81 t/ha, at leased grasslands it was 1.51t/ha. In the case of the pastures (own and leased total) the hay yield was 1.86 t/ha while it was only 1.56 t/ha on pasture (Table 6).

Table 6: Average yield of the grasslands on various utilization forms, besides own and leased grasslands of the estimated farms, t/ha (2002)

Denomination		Hay yield, t/ha		
		Own grassland	Leased grassland	total
Meadow	number of farms	43	27	70
	area (ha)	1144.27	1125.59	2269.86
	total yield (tons)	2546.9	1664.42	4211.32
	average yield (t/ha)	2.23	1.48	1.86
Pasture	number of farms	75	37	112
	area (ha)	2326.04	2915.69	5241.73
	total yield (tons)	3750.7	4426.1	8176.8
	average yield (t/ha)	1.61	1.52	1.56
Grasslands total	total yield (tons)	6297.6	6090.5	12388.1
	average yield (t/ha)	1.81	1.51	**1.65**

Source: own database

I surveyed the state of the organic and artificial fertilization. The 26.4% of the examined territory received nutrient supply, based on the National Statistical Bureau's data it is only the 2.4% of the county's used grassland. Based on my data the average of the artificial fertilization placed was 70 kg/ha, average of the organic fertilization was 12.6 tons/ha.

Based on the survey I came to the conclusion that among the grasslands the permanent grassland is used mainly in spite of the lower yield. The reason could be that they do not need special investment or treatment and low number of the livestock does not require higher yield.

I also collected data about purchasing hay to feeding the livestock. Among the asked farmers 23 buy hay altogether 869.6 tons, the average is 37.8 tons. 84 farmers do not need purchasing extra hay. We can draw the conclusion that those 23 farmers who need to buy hay have 0.3 ha/livestock meanwhile those who do not have to buy have 1.02 ha/livestock. In the case of the hay-buyer farmers the livestock rate was 122 livestock/farm, in the case of the non-buyers it was 58.4 livestock/farm. It can be said that the available small grassland is usually connected to great livestock and the mass production is not enough for the livestock so extra purchasing is required.

Agricultural environment protection

Since the 90's the environmental protective, soil and landscape protective, biodiversities supplying techniques have become more important. These procedures mean extensive cultivation that realized as law in 1999 in Hungary by introducing the National Agricultural Environment Protection Program (later on: NAKP). The grassland management program of

the NAKP can be treated as success within the country, in the region and in the county of Szabolcs-Szatmár-Bereg (Table 7.).

Table 7: Data of the NAKP's extensive Grassland Utilization Program in 2002 and 2003

Denomination	Supported area				Number of supported applications				Obtained subsidy			
	2002		2003		2002		2003		2002		2003	
	thousand ha	%	thousand ha	%	db	%	db	%	M Ft	%	M Ft	%
County of Szabolcs-Szatmár-Bereg	5.03	6.23	5.31	5.95	138	10.45	149	8.94	40.25	6.23	53.1	5.95
Hungary total	80.69	100	89.14	100	1320	100	1667	100	645.51	100	892.27	100

Source: Based on FVM 2004; FVM Szabolcs-Szatmár-Bereg Megyei Hivatala 2003a; Internet 1 2004 and own calculation

Almost 9% of the supported applications dealing with grassland and almost 6% of the obtained subsidy can be found in the county of Szabolcs-Szatmár-Bereg. From the lands received NAKP support 38% was grassland that also proves that the project was popular among the grassland owners. More than 50% of the farmers examined received NAKP support. In order to use the grassland more effectively 37.3% of the farmers received complementary animal-approach assistance for having animals, the sheep stock was increased in the highest rate (84%). The support given for agriculture environment protection connected to grassland can be seen in Table 8.

In 2004 the steps of the NAKP was changed by the provisions of the Program for Agriculture Environment Management and within this 20% of the grassland is supported in the county. The reduction was to due to the introduction of plough-land programs. From 2002 till 2006 the size of the supported grassland was increased by fourfold. The number of projects was also increased fourfold and the financial support was increased by eightfold at the end of 2006.

The supplementary support for livestock is connected to grassland usage programs, the aim is to promote the quality animal keeping required in the programs and to keep the 0.5-1 animal/ha regulation. Half of the farms examined achieved the obligation they undertook within 5 years. From those who requested support for grassland 25 farmers won supplementary support for keeping sheep, cattle and pig.

Table 8: Agri-environment Protection and Agri-environment Utilization subsidies connected to grasslands Nationwide and in the county (2002-2006)

Denomination		Supported grassland		Number of supported applications, farmers		Obtained subsidy	
		thou-sand ha	from the national %	piece	from the national %	M Ft	from the national %
Hungary total	2002	80.69	100	1320	100	645.51	100
	2003	89.14	100	1667	100	892.27	100
	2004	304.94	100	5481	100	5581.54	100
	2005	304.94	100	5481	100	5581.54	100
	2006	304.94	100	5481	100	5581.54	100
County of Szabolcs-Szatmár-Bereg	2002	5.03	6.23	138	10.45	40.25	6.23
	2003	5.31	5.95	149	8.94	53.1	5.95
	2004	19.20	6.30	529	9.65	333.95	5.98
	2005	19.20	6.30	529	9.65	333.95	5.98
	2006	19.20	6.30	529	9.65	333.95	5.98

Source: FVM Szabolcs-Szatmár-Bereg Megyei Hivatala 2003a; FVM 2004; MVH 2007

3.3. Grassland usage

The changing of the cattle stock can be seen on Table 9.

Table 9: Cattle stock in the estimated regions, entity (1990-2005)

Cattle stock, entity					
Denomination	Hungary (entity)	Northern Great Plain		County of Szabolcs-Szatmár-Bereg	
		stock (entity)	Proportion from the national (%)	stock (entity)	Proportion from the region (%)
1990	1631000	-	-	*74200*	-
1994	910000	195000	21.4	44000	22.6
1998	873000	202000	23.1	44000	21.8
2002	770000	179000	23.3	37000	20.7
2005	708000	168000	23.7	33000	19.6
Decreasing from 1990 (entity)	**923000**	**40000[1]**	**-**	**60500[2]**	**-**
Proportion of decreasing from 1990 (%)	**56.6**	**19[1]**	**-**	**64.7[2]**	**-**

The National Statistical Bureau did not published individual farm data

[1] between 1994-2005; [2] between 1991-2005

Source: Based on KSH 1994; 1995a,b; 1996; 1997; 1998; 1999; 2000a,d; 2001; 2002a; 2003; 2004; 2005; 2006; KSH Debreceni Igazgatósága 2005; KSH Szabolcs-Szatmár-Bereg megyei Igazgatósága 1992; 1994; 1995; 1996; 1997a,b; 1999; 2000; 2001; 2003; Internet 3 2008; Internet 4 2008 and own calculation

The biggest decreasing of the cattle stock (more than 4.1%) was in 2005 in Szabolcs-Szatmár-Bereg county and in the North Great Plain Region. Within the country the number of the cattle stock was reduced with 923000, 56.6% between 1990 and 2005. The number of the cattle stock was the highest in 1998, and the reduction was decreased by 16.8%. In the county of Szabolcs-Szatmár-Bereg between the examined period (between 1991 and 2005) the cattle stock was reduced by 60500, 64.7%. Taking into consideration the general data of 1994 and 2000 in the county the cattle stock was reduced and concentrated by 251%.

Table 10. shows the sheep stock changing of Hungary, the North Great Plain region and Szabolcs-Szatmár-Bereg county.

Table 10: Sheep stock in the estimated regions, entity (1990-2005)

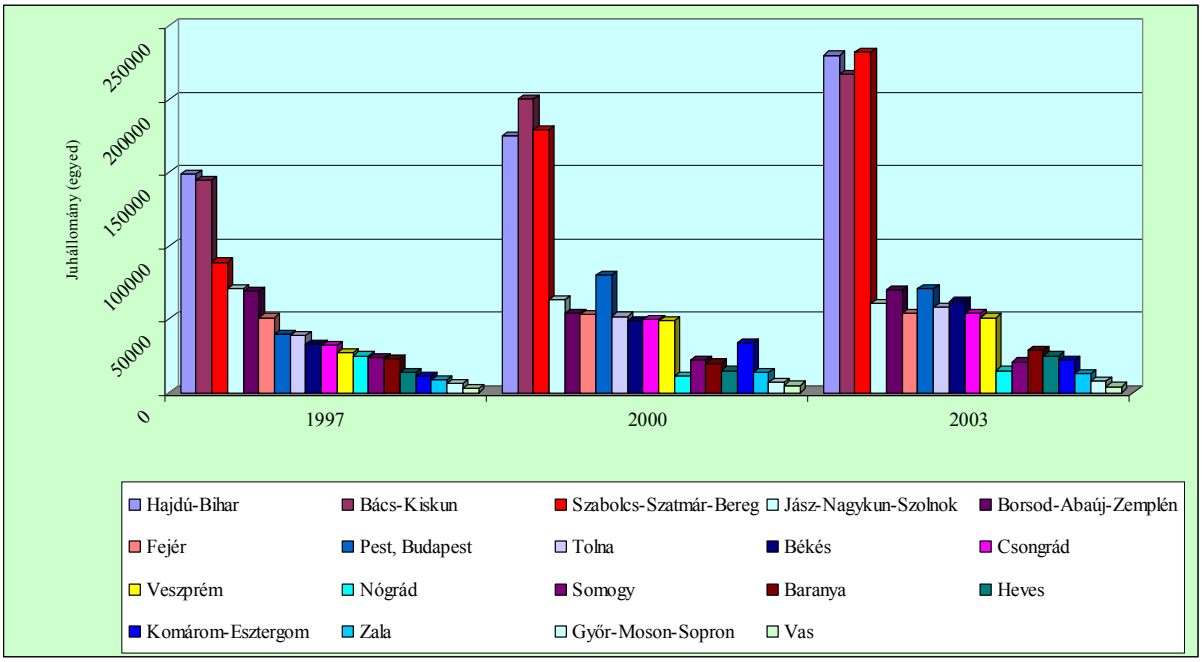
Sheep stock, entity					
Denomi-nation	Sheep stock of Hungary	Northern Great Plain		County of Szabolcs-Szatmár-Bereg	
		sheep stock	proportion from the national (%)	sheep stock	proportion from the regional (%)
1990	1865000	-	-	244000*	-
1994	947000	364000	38.4	117000	32.1
1998	909000	337000	37.1	97000	28.8
2002	1103000	404000	36.6	164000	40.6
2005	1405000	531000	37.8	173000	32.6

* data of 1991

Source: Based on KSH 1994; 1995a,b; 1996; 1997; 1998; 1999; 2000a,d; 2001; 2002a; 2003; 2004; 2005; 2006; KSH Debreceni Igazgatósága 2005; KSH Szabolcs-Szatmár-Bereg megyei Igazgatósága 1991; 1994; 1995; 1996; 1997a,b; 1999; 2000; 2001; 2003; Internet 4 2008 and private calculation

The changing tendency of the sheep stock is not the same in every examined year in the case of the county of Szabolcs-Szatmár-Bereg and the Northern Great Plain region. Between 2003 and 2005 the stock of the country and the region increased while the stock of the county reduced between 2003 and 2005. Within the sheep stock of the region county of Szabolcs-Szatmár-Bereg had the lowest, 28.8% in 1997 and 1998, in 2003 the highest rate was 44.4%.

The sheep stock of the counties of Hungary can be seen on Figure 6. In the rank of the countries Szabolcs-Szatmár-Bereg was the third in 1997, in 2000 it was the second, and in 2003 it was on the top.

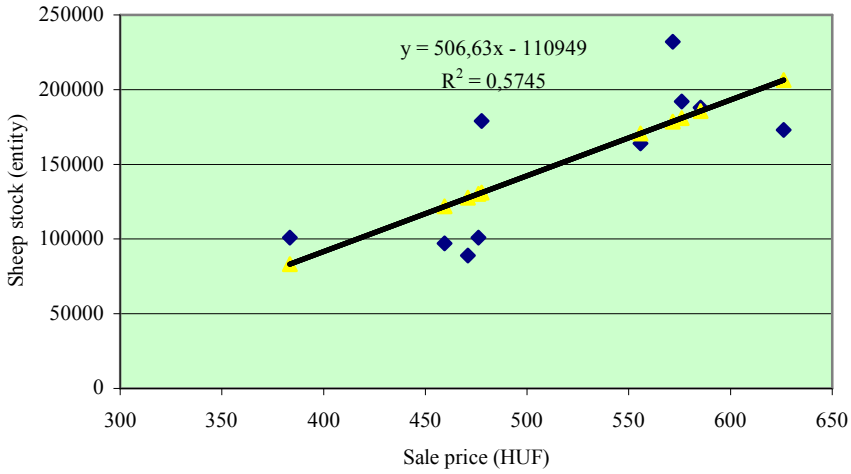


Source: KSH 1999; 2002a; 2005

Figure 6: Sheep stock in the counties of Hungary, entity (1997, 2000, and 2003)

In the case of the sheep stock it was recognizable that the stock was concentrated by 183%. In the examined 6 years the number of the sheep breeders reduced the size of the stock increased.

I examined whether the average price (sale price) influences the size of the sheep stock (Figure 7.). The sheep stock can be increased relatively easily due to the shorter generation interval and the bigger stock if the sale prices or the breed support are higher.



Source: Based on KSH 1994; 1995a,b; 1996; 1997; 1998; 1999; 2000a,d; 2001; 2002a; 2003; 2004; 2005; 2006 and own calculation

Figure 7: Correlation and regression between Szabolcs-Szatmár-Bereg county's sheep stock and the sheep selling price (1996-2005)

There is correlation between the country data, the correlation co-efficient, r=0,758, the correlation shows stronger connection than the average. The connection among the variables is significant. The regression analysis shows linear connection among the variables. The determination co-efficient (r^2) explains by 57.5% the changing of the sheep stock.

The almost 67% of the farms examined (Table 11.) deal with sheep breeding, the average stock for one farm is 365.

Table 11: Livestock data of the estimated farms and companies, entity (2002)

Denomi-nation	Livestock, entity							Total
	Cattle	Sheep	Horse	Swine	Goat	Donkey	Goose	piece / %
Number of breeding farms	46	64	31	2	14	1	1	96
Proportion of the species in the breeding farms	47.9	66.7	32.3	2.1	14.6	1	1	100
Total livestock, entity	7370	23363	111	60	240	3	3000	-
Average livestock, entity/bree-ding farm	160.2	365	3.6	30	17.1	3	3000	-

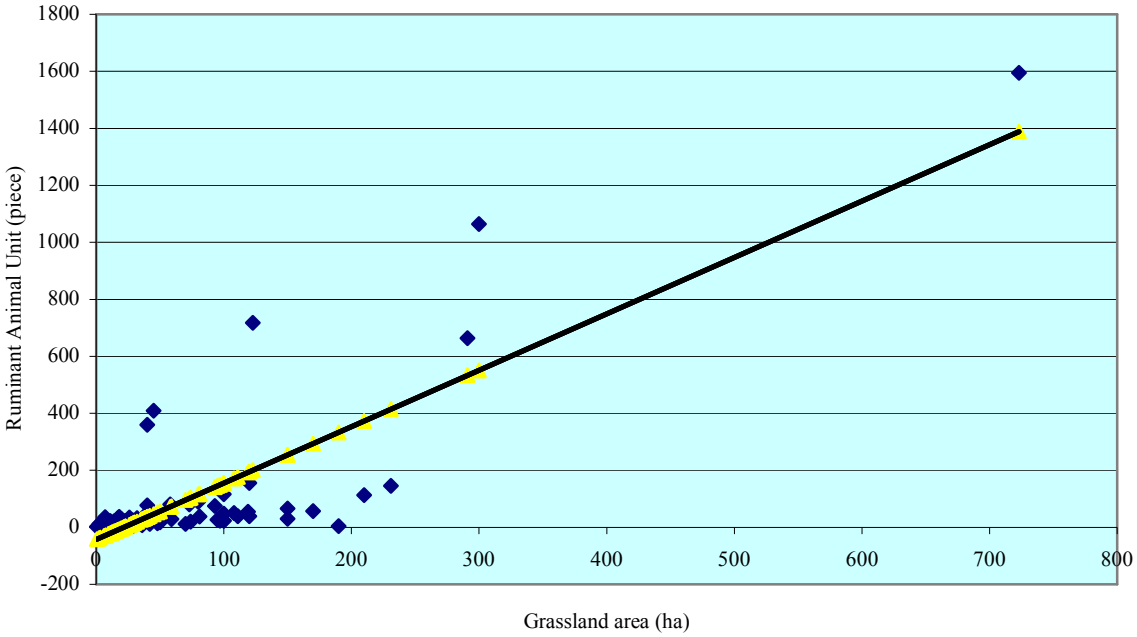
Source: own database

Among the 96 animal breeding farms 28 deal with only sheep. Almost half of the farms (47.9%) deal with cattle, the average number of cattle is 160. Among the animal breeding farms 20 have only cattle. Keeping horse is rather for hobby, the examined stock is 111, in 32.3% of the farms have horse. Among the farms examined 14 have goat (this 14.6% of the animal breeding farms) for milk. Two pig keeping farms deal with mangalica, one has 50 and 10 entities and in one farm the main profile is goose and one farm three donkeys are kept for pleasure.

I found out that the farmers mainly deal with one kind of animal. In farms where they have two species, beside sheep the second one was goat or horse, beside cattle the second one was goat or horse. To sum up, the rate of the farms keeping three or more species is 16%.

I did correlation and regression analysis (Figure 8.) from the data of the survey by using the data of sheep and/or cattle keeping farmers between the ruminant animal stock and the whole

grassland. It can be said that the size of the grassland influences the size of the ruminant animal stock.



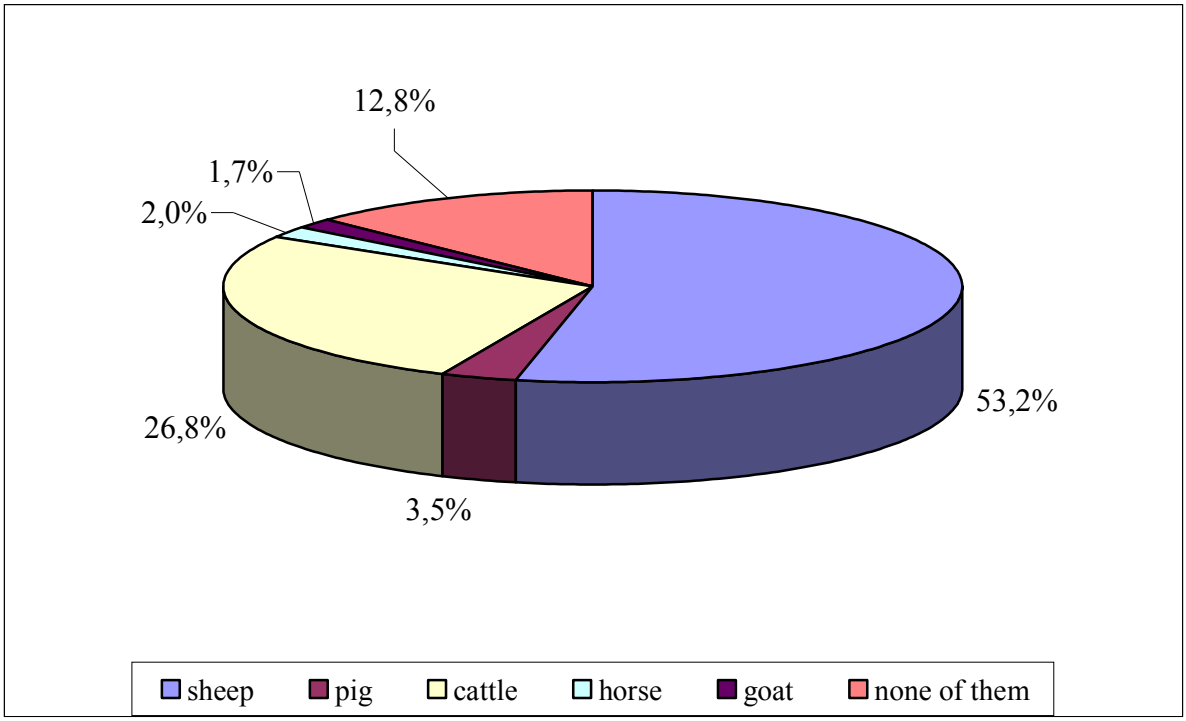
Source: own database and calculation

Figure 8: Correlation and regression between the surveyed ruminant stock and the whole grassland area (2002)

There is correlation among the data, the correlation co-efficient is r=0.822, the correlation shows strong relation. The connection among the variables is significant. The regression analysis shows linear relation among the variables. The determination co-efficient (r^2) explains by 67.6% the size of the grassland and the changing of the ruminant animal stock.

More than 53% of the farmers found obvious to improve the sheep stock, 26,8% wanted to improve the cattle stock and only 7,2% found important to increase the pig, horse or goat stock (Figure 9.). Some of those who answered (12,8%) did not find it justified to develop the livestock.

I made categories based on the state of the grasslands. 1. category: weak state, the production rate is below 1,5 t/ha, 2 category: medium, the production rate is between 1,5-4 t/ha, 3 category: good state, the production rate is beyond 4 t/ha. Only 7% of the farmers found the state of the grasslands, production rate, cultivation good, 59% found it medium, 34% found it weak. These data reflect the state of grass management in the county and by no means can it be treated as justified or acceptable.



Source: own database

Figure 9: Conceptions of live stock improvement among the farmers (2002)

3.4. SWOT analyses of grassland management

In the following table I collected the strong and weak points of the sector examined and the opportunities and the threats (Table 12.).

It is necessary to carry out economical grass management and animal keeping, profitability is required at the extensive grasslands, but increasing productivity (within reasonable limits), nutrient management, watering, renovation of grasslands, re-planting, developing agriculture technology and animal stock are also very important.

Table 12: SWOT-analysis of the grasslands – grassland utilization – animal keeping

STRENGHTS	WEAKNESSES
- great territory of almost untouched nature, environment, - big rate of grassland from the whole territory of the country and the agricultural land, - the plants forming grass and the plants associations have an important protective role against water and wind erosion, - the composition of the grass (e.g. medicinal plants) makes possible the nature close and bio farming, - the scientific research results would make possible the production increase.	- the economic situation is disadvantageous for utilization of territory and animal keeping, - depreciation of unused grassland can be experienced, - lack of infrastructure of the usable grasslands, - lack of productivity increasing techniques (nutrient supply, watering), - at the countryside the variety of available grass seed grain for farmers is narrow, - in some places the property relations are not clear and this reduces the level of utilization, - the owners of the grassland and the livestock are two separate circles.
OPPORTUNITIES	THREATS
- potential mass crop base for ruminants, - at grasslands that cannot be used for other plants grazing animals are essential, - chance of bio mass production as a renewable energy source at grasslands, - preservation of the country landscape, - developing village tourism, - grasslands offer chance for resting, recreation, sport and contribute to the aesthetic environment, - to make further researches and analysis and rethink the "extensive - intensive" problems of grass usage by strengthening the relation between farmers and environment protectors in order to improve the state of the sector.	- reduction of the size of the usable lands, - at the unused grasslands the disadvantageous circumstances do not facilitate animal keeping, - the size of the cattle stock reduced dangerously, - reduction of the sheep stock started, - the financial policy of ruminant animal stock is unsettled, - the right protection of the private property is a problem, the property safety is not adequate, - the direct measuring of grass production instead of measuring it by animal keeping indicators, - there is no reasonable grass usage and the machine stock is aged.

3.5. Main consequences, statements

Based on the data analyses and the experience of the surveying I drew the following conclusions and put forward proposals on three spheres of my examination.

<u>Regarding to grass management agricultural technology</u>

The size of the grassland reduced significantly. In the county of Szabolcs-Szatmár-Bereg the reduction was over 15% and that was disadvantageous for the sector. The size of the leased lands is increasing and the yield is lower in comparison with private grasslands that are due to the usage circumstances and location differences. The present situation can be best seen by

the production results and yields that have been showing decreasing tendency since the beginning of the 90's. In accordance with the livestock the yields reduced those have negative effect in comparison with the 1990 base. The rate of the used grassland in the county of Szabolcs-Szatmár-Bereg was between 15%-54% meanwhile in country level it was 18-67%.
The low usage rate – apart from environmental protection lands – predicts the devaluation and valueless of the lands. 90% of the grasslands used are ancestor grassland so the rate of grass planting is very low. This can be explained by the income production ability and with low livestock the expensive plantings are not remunerative.
The nutrient management suffered from the biggest recession in the last one and half decade. It is thought-provoking since the farmers do not use the most efficient production increasing procedures but they can be used in lands that are not under protection and they would improve animal supplying ability of the lands. In order to have suitable grass management the usage of artificial fertilizer is necessary and essential nowadays.
The property relations changing also had negative effects on the sector, in several cases the livestock keepers remained landless. The heterogeneous livestock requires large grasslands and good quality, in other lands due to the lack of livestock useless lands can be found. The lands become divided (the examined average grasslands in most cases is 22 ha) and the top of it all we can meet the problem of the undivided lands.
As a positive thing it can be mentioned that adequate work force is presented but it is not always opened to adequate expertise and open mind for new things. The engine supply of the farms is adequate but machines for grass management are defective which reduces the quality of the sector. To sum it up, it can be said that the agricultural factors, supported by data that the importance of the sector reduced and at the same time they mark the fields requiring development.
Under the present management circumstances the agricultural circumstances and conditions will not improve significantly because the size of the fields will decrease and the increase of watering and nutrient supply cannot be expected as well. I advise the increase of nutriment supply, state preserve and cleaning mowing on lands that are suitable for them. The research, professional and machinery conditions for improving the agricultural techniques are given but they can be used profitably under bigger livestock and crop need.

Regarding the agricultural environment protection

The basic aims of the steps done regarding agriculture environment protection are by all means valuable and have great importance. This importance is supported by the success of the

NAKP and AKG programs in Hungary and in the county of Szabolcs-Szatmár-Bereg level that shows more than 100% growth. Building in environment managing elements in the farming was the tendency of the last decade and that was not traditional for the country. The policies of environment managing strengthen the extensive direction of grass usage. In this extensive grass usage I advise the Hungarian grey and its cross-breeding and the Hungarian merino pasturing because these species due to their simplicity can be used in extensive grass management.

Regarding to grass usage

The grass usage has lower quality according to professionals and farmers in comparison with the situation 15-18 years ago. Only 7% of the farmers asked treated his/her grassland adequate and that cannot be said as acceptable. According to the farmers the problems of the sector are complex which is due to the economic and financial difficulties. They know what should be done – some of them even mentioned it – that is around lack of capital, professional advising, size of livestock and professional grass management and usage. To solve the selling problems would be a great capital and production safety factor, for this enough livestock and agricultural co-operations are required.

The number of the ruminant livestock also decreased significantly. The decreasing tendency of the cattle stock is still noticeable nowadays. The number of the sheep stock was fluctuating in the last one and half year, but compared to the base the decrease is significant. Other problem is the heterogeneous location of the livestock, the lack of grassland in case of the animal keepers and the concentration of livestock. The typical complex animal breeding has changed, some farms dealing with some kind of animals have almost disappeared just like drove. Most of the animal keepers are dealing with one kind of animal.

The sheep breeders are directly affected by the lack of qualified work force and conscience shepherds so in accordance with professionals view I advise to improve professional trainings.

The disadvantageous financial state also effects significantly that is also important in the sheep breeding. I advise in sheep and cattle breeding to set up fences and pastures that would promote financial security and professional pasturing grass usage. To set up enclosed territories under the circumstances of the county of Szabolcs-Szatmár-Bereg I advise in any case because it would promote the effective usage of the divided grasslands.

It is an important question that still the number of the livestock is not enough for the usage of the yield of the grasslands is it necessary to improve agronomy, usage side problems? I think

– under the current circumstances – it is not. Effective strategic plan is necessary for the sector in order to put the animal breeding sector on an expansion route that by all means would be followed by the factors and state of the grass sector.

It find it important the further strengthen of ecofarming since the majority of the grasslands are suitable for this and at the same time ecofarming is not extensive one but it harmonizes tightly with the environment. In an eco way but with nutrient supply and species utilization higher profit can be reached – supplied with supports – than in the case of traditional utilization.

It can be said that in spite of the tight connection between the ruminant stock and the grasslands these two fields have become separated. In the current state of grass usage – in spite of the positive things (e.g. modern, sectional grazing) – does not contribute to the development and improvement of the grass section.

Future tasks

The liming conditions of grass production and usage (e.g. prohibition of nutriment supply and watering) set up a situation for grass management farmers and animal keepers that even in spite of the occasional supplementary financial support makes difficult to farm. Generally the agriculture environment protection steps are serving to develop the sector but they are unable to solve the problems of grass usage and animal keeping in the country. By applications the lands for extensive usage should be marked after complex researches. In a long run how effectively will the environmental protective farming facilitate the grass farming and animal keeping? The farmers' opinions are often sceptical about extensive development. The questions arose hurry further researches and analyses and I try to answer them during further researches.

4. NEW SCIENTIFIC RESULTS

1. In the county of Szabolcs-Szatmár-Bereg the production and agronomy circumstances of the grasslands devalued between 1990 and 2005. During the last 16 years the grassland area of the county of Szabolcs-Szatmár-Bereg reduced by 15.4%, facing the whole country's 10.9%, while the hay production reduced 88.6% and in Hungary 77.4%. The level of the nutrient supply, missing grass planting and the reduced profitability bring down the grass sector.
2. In the county the number of cattle and sheep stock reduced and concentrated, the majority of the farmers gave up keeping cattle stock, grassland ownership and –usage

have become separated. In the county of Szabolcs-Szatmár-Bereg strict correlation can be pointed out between the number of ruminant stock and the size of the grasslands (r=0,822).

3. In the county of Szabolcs-Szatmár-Bereg I realized stronger correlation than the middle (r=0,758) between the number of sheep stock and the selling price of the meet sheep in 13 year's average, in country level the correlation stronger (r=0,86).
4. The agricultural environment protection and agricultural environment management programs related to grasslands were successful between 2002 and 2006. The number of the supported applications and the size of the lands fourth folded and the financial support eight folded.
5. The total area and the average size of the grassland were larger than the own grass fields, which characterize the rights of ownership in the county of Szabolcs-Szatmár-Bereg. The leased grassland area per one farm was twice larger than the own grasses. The grass ownership and the –usage occasionally have become separated.
6. Almost 67% of the farms examined deal with sheep breeding; almost half of them (48%) deal with cattle, which well characterize the texture of animal breeding in the county of Szabolcs-Szatmár-Bereg. The farmers mainly deal with one kind of animal. In farms where they have two species, beside sheep and cattle the second one were goat and/or horse. 53% of the farmers found obvious to improve the sheep stock, 27% wanted to improve the cattle stock, while some of them (13%) did not find it justified to develop the livestock.
7. Only 7% of the farmers found the state of the grasslands, production rate, cultivation good, 59% found it medium, 34% found it weak; which data reflect the unfavorable state of grass management in the county.

5. PARTICULAR UTILITY OF THE RESULTS

The state of the agronomical and the agriculture environmental protection of the grass management of the count of Szabolcs-Szatmár-Bereg and its comparable analyses and my conclusions and suggestions and factual materials for the farmers and professionals of the county will help in their further work and in their middle and long planning. The survey of the professional literature and results of my paper can be used in the fields of teaching, research and professional advising.

As I finished my paper I do not treat my work finished since the questions arose connected my results encourage me for further researches.

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