THE BIG GAME UNIT (BGU) AS AN ECONOMIC INDEX TO COMPARE BIG GAME MANAGEMENT IN DIFFERENT HABITATS

A NAGYVADEGYSÉG (NE) MINT GAZDASÁGI MUTATÓ, AZ ELTÉRŐ ADOTTSÁGÚ ÉLŐHELYEK NAGYVADGAZDÁLKODÁSÁNAK ÖSSZEHASONLÍTÁSÁRA

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ABSTRACT

This article demonstrates the comparative examination of the financial data found in the report of the game management concerning the counties of the South-Transdanubian Region. The most healthy cost structure was in Tolna County nevertheless the 2003/2004 hunting year showed a deficit. In Somogy and Baranya counties the damage caused by game was so big that the management could not compensate it.

The recently introduced big game unit (BGU) as an economic index clearly shows the difference of big game management among the counties. To produce a big game unit causes a loss of 20% in Somogy County 10% in Baranya and 2% in Tolna Counties in the financial balance in 2005/2006 hunting year.

Keywords: big game unit, economic index, big game management

ÖSSZEFOGLALÁS

A cikk bemutatja a vadgazdálkodási jelentésben található pénzügyi adatok összehasonlító vizsgálatát a Dél-dunántúli Régió megyéire vonatkozóan. A legegészségesebb költségszerkezet Tolna megyében volt, mégis a 2003-2004-es vadászati évet ez a megye is veszteséggel zárta. Somogy és Baranya megyében a mezőgazdasági vadkár akkora terhet rótt az ágazatra, amit nem tudtak kigazdálkodni.

A bevezetett ún. nagyvadegység (NE) gazdasági mutató megmutatta a megyék közti nagyvadgazdálkodás különbségét. A 2003-2004 vadászati évben egy nagyvadegység „előállítása" Somogy megyében 20%, Baranya megyében 10% míg Tolna megyében 2% veszteséget okozott.

Kulcsszavak: nagyvadegység, gazdasági mutató, vadgazdálkodás

DETAILED ABSTRACT IN HUNGARIAN

A cikk bemutatja a vadgazdálkodási jelentésben található pénzügyi adatok összehasonlító vizsgálatát a Dél-dunántúli Régió megyéire vonatkozóan.

Megvizsgáltuk az egyes megyékben a bevételek, kiadások szerkezetét és az egyenleg alakulását 1994 óta. A vadgazdálkodási körzetek évente készítenek jelentést gazdálkodásuk eredményéről, amely a vadállomány természetes és pénzügyi adatait, valamint a vadkár és a pénzbírságok értékeit tartalmazza, és a Vadgazdálkodási, Halászati és Vízgazdálkodási Főosztály felé nyújtják be. A 2003/2004-es vadászati évtől kezdődően a jelentések a támogatások összegét is tartalmazza. A rendelkezésre álló pénzügyi adatokat az infláció éves változásait figyelembe véve elemeztük. Az összes bevétel és kiadás valamint az egyenleg időbeli változásait az adatokra leginkább illeszkedő lineáris trendvonal felvételével vizsgáltuk. Mivel a három megye területe, földrajzi- éghajlati viszonyai és vadgazdálkodási adottságai eltérőek, ezért az elemzés árnyaltabbá tételéhez fajlagos mutatókat is vizsgáltunk. Az összes bevétel, az összes kiadás és az egyenleg értékeit a megyék nagyságára, az erdő- és termőterületre vetítettük. Ezen vizsgálatok eredményei jól jellemezték a különbségeket, leírták a megyék vadgazdálkodási sajátosságait.

A vadgazdálkodás gazdaságossága országos szinten is folyamatosan romlott, 2003-ban a Dél-dunántúli Régió mindhárom megyéjében és országosan összesítve is veszteséggel zárt az ágazat. Somogy és Baranya megyében a mezőgazdasági vadkár megelőzésére, csökkentésére kellene forrásokat biztosítani. A bevételeknél Tolna és Somogy megyében a kínált szolgáltatásokat kellene fejleszteni, ebben még tartalékokkal rendelkeznek Baranya megyéhez képest. Az infláció hatását nem képes az ágazat kiküszöbölni. Ennek oka, abban keresendő, hogy az Európai Unióban lévő recesszió a fizetőképes kereslet csökkenését eredményezte. A vendégkör megtartása érdekében a nagyvad árak nem követték az infláció mértékét. További negatív hatásként jelentkezett a Ft/Euró árfolyamok kedvezőtlen változása. A gazdasági eredményeket vizsgálva látható, hogy Tolna megye gazdálkodása volt a leghatékonyabb erdőterületegységre (km^2) vetítve. A veszteséges év kivételével többszörösét produkálta, mint a régió másik két megyéje, azonban az erdősültsége is lényegesen kisebb. Az egyenleg trendvonala viszont negatív meredekségű, ami arra figyelmeztet, hogy a leghatékonyabban gazdálkodó megyében is romlanak a vadgazdálkodási feltételek.

Az egyes megyékben más a nagyvadfajok aránya. A nagyvadegység (NE) azt mutatja meg, hogy egy adott élőhelyen hány gímszarvast kellett volna elejteni, ahhoz hogy árbevétel ne változzon. Tulajdonképpen a nagyvad terítéket nagyvadegységben – ökonómiai gímszarvas – fejezzük ki. A pénzügyi adatokat a nagyvadegységre vetítve összehasonlíthatóvá válik a régió megyéinek gazdálkodása.

A bevezetett ún. nagyvadegység (NE) gazdasági mutató megmutatta a megyék közti nagyvadgazdálkodás különbségét. A 2003-2004 vadászati évben egy nagyvadegység „előállítása" Somogy megyében 20%, Baranya megyében 10% míg Tolna megyében 2% veszteséget okozott. A 2004-2005-ös vadászati évben kedvezőbbek a mutatók az egész régióban, legnagyobb a javulás Baranya megyében (8%). Somogy megyében minden nagyvadegységre 19% veszteség jut, Baranya megyében „csak" 2% míg Tolna megyében már 3% nyereséget könyvelhettek el.

INTRODUCTION

There are several methods appropriate for the comparison of game management of different areas. This paper introduces the index of big game unit (BGU), which can be used for the comparison of big game habitats. The study compares the game management of the three counties of the South-Transdanubian Region. We can use this index to compare hunting clubs or to analyse the time series data of a given area.

The South-Transdanubian region is characteristically a big game territory, where the red deer (Cervus elaphus), the fallow deer (Dama dama), the roe deer (Capreolus capreolus), and the wild boar (Sus scrofa) find suitable habitat and have important stock size. The stock of the red deer, the fallow-deer and the wild boar needs to be reduced. The size of moufflon (Ovis ammon) population is insignificant. With the exception of 12 (small game hunting) areas, all the other (more than 150) are big game areas (Figure 1) in the examined counties (Baranya, Tolna, Somogy).

Among the big game species, the quality of the red deer and the fallow deer occurring in the region is outstanding internationally, which is the joint result of the excellent genetic background and good habitat.

MATERIAL AND METHODS

The regions prepare annual game management reports (the hunting year endures from year 1st March to next year 28th February), which are transmitted to the Main Department for Game, Fisheries and Water Management. A report contains the number of harvested game, data of the savage agriculture, financial data, and the data of the damages caused by game and fines. From the 2003-2004 hunting year, the resources gained by tenders and

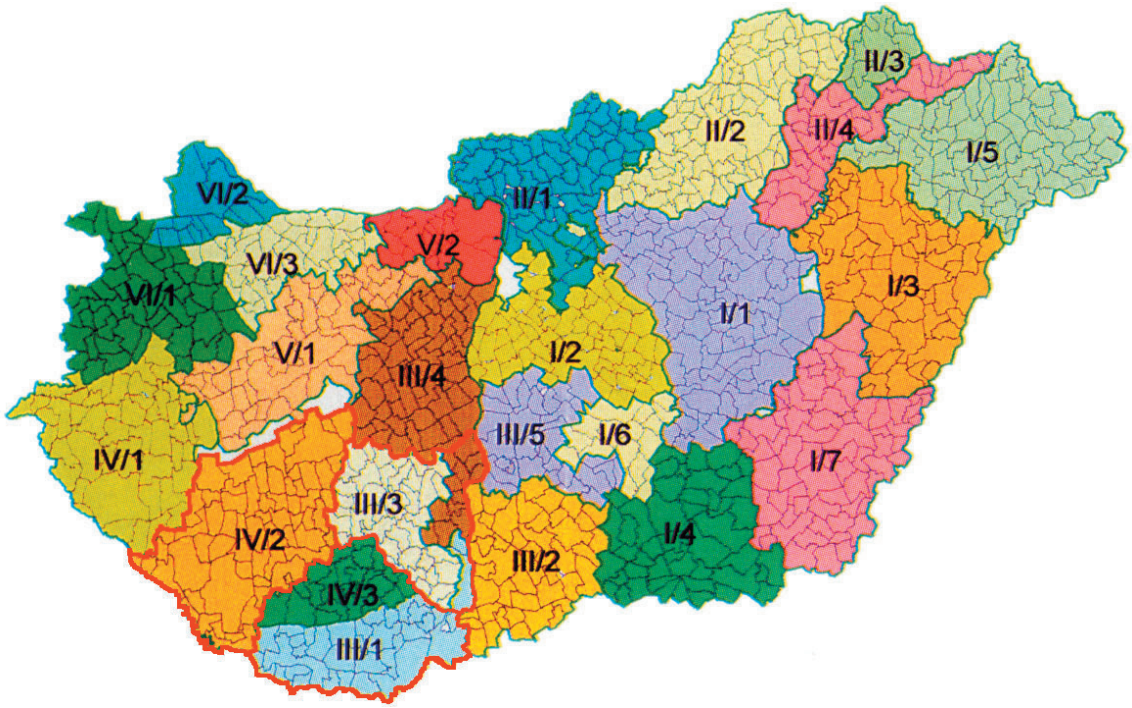

Figure 1: Game management districts in Hungary

subsidies took part in the report, too. The financial data are just informative, they were not made for balance sheet or profit and loss account, they apply for hunting and not civil year, they have cash flow approach.

The financial data of South-Transdanubian Region counties (Somogy County, Baranya County and Tolna County) found in the game management reports were collected from the National Game Management Database's yearly mass of facts [2], [3], [4], [5], [6], [7], [8], [9], and were scheduled. The data are available from 1994 to 2005. The data of the 2006-2007 hunting year had to be transmitted until the 20th Marc, that is why they can not be elaborated.

At first I examined the structure of incomes and expenses in several counties, and the balance's conversion from 1994. During the analysis, I did not take into account the resources gained by tenders and subsidies, because they disfigure the management's parameters.

I modified the available financial figures according to the inflation's yearly fluctuation (1994=100%). The calculation was disposed leaning on the Hungarian National Bank's data [11].

The aggregated income and expenses, just as the fluctuation of the balance were examined by the linear trend-line (y=ax+b) mostly fitting to the data. Instead of expressing the changes in relative numbers (e.g. percentage of change between the first and last years of the analysed period) I rather used the parameter "a" of the trend lines, which give information on the 'average' change during the whole period.

As the three counties' surface, climatic conditions and their game management practice are different, for this to make the analysis more tint, I examined specific figures. The data of the aggregated income, expense and the balance were exteriorized to the extent of the counties and the forest and bearing surfaces.

The big game unit

The financial figures could be exteriorized to the amount of the harvested game too. However the proportions of the occurent game species are not the same in different habitats, and their quality – and due to this their prices – are different too.

The ability to support the game population of a habitat is featured by the field's red deer supporting ability [10]. Because the red deer is not native everywhere, therefore a so-called deer unit was introduced for the comparability of different game species' feed consumption, which compares the big game's feed consumption to the red deer's one. This figure is suitable for the comparison of the different habitats.

With the introduced big game unit the revenue of other big game realised is correlated to the red deer's one [1]. In this way we can get an index for every game species,

which shows that how many hunted game gives revenue equal to that given by an average red deer. The revenues from the sales of game meat as well as of the trophies have to be calculated.

This unit changes yearly and regionally, therefore the index was counted from the means of more game management unit's revenues by game species.

In virtue of the index, I counted how many big game unit were the yearly bag of the three counties in the 2003-2004 hunting year. After that the rates of the aggregated income, the aggregated expense and the balance were exteriorized to the big game unit. I made the calculations for the 2004-2005 and 2005-2006 hunting years too.

RESULTS AND DISCUSSION

The analysis of the income structure

The paid hunting by foreigners and the related services were the half of the revenues, from year to year in all of the three counties (Figure 2). In Baranya County the shortage of the revenues due to less paid hunting by foreigners, was compensated by the higher rate of the related services.

The decreasing hunting revenue from foreigners were set off, in the three counties, by the increasing rate of national hunting, which is the biggest in Tolna County, while this county is the second in the revenues of paid hunting by foreigners too.

The revenue of live game is not decisive among the incomes, the biggest it is in Tolna County with 1.2 % in average.

The rate of the income from the harvested game fluctuated round 20% in Somogy County, 24% in Baranya County, 21% in Tolna County, and it was the highest in the three counties in 2001.

The other incomes fluctuated between 10% and 14% in the three counties.

The analysis of the cost structure

Considering the expenses (Figure 3), the rate of wages is the lowest in Somogy County, in average it is 14%, while in Baranya and Somogy County it is 17%, in average.

Among the expenses, game management cost was the biggest, with 41% in Somogy County, in average 38% in Baranya County, and it was the highest in Tolna County, in average 53%.

The rate of the agricultural damages caused by game is 23% in Somogy County in average, 20% in Baranya County, and in Tolna County it is only 6%! It is much lower than in the other two counties. The reason for it is that a part of the territory of Tolna County is populated by big game (12 small game hunting areas), while the whole part of Somogy and Baranya County is game management division with big games.

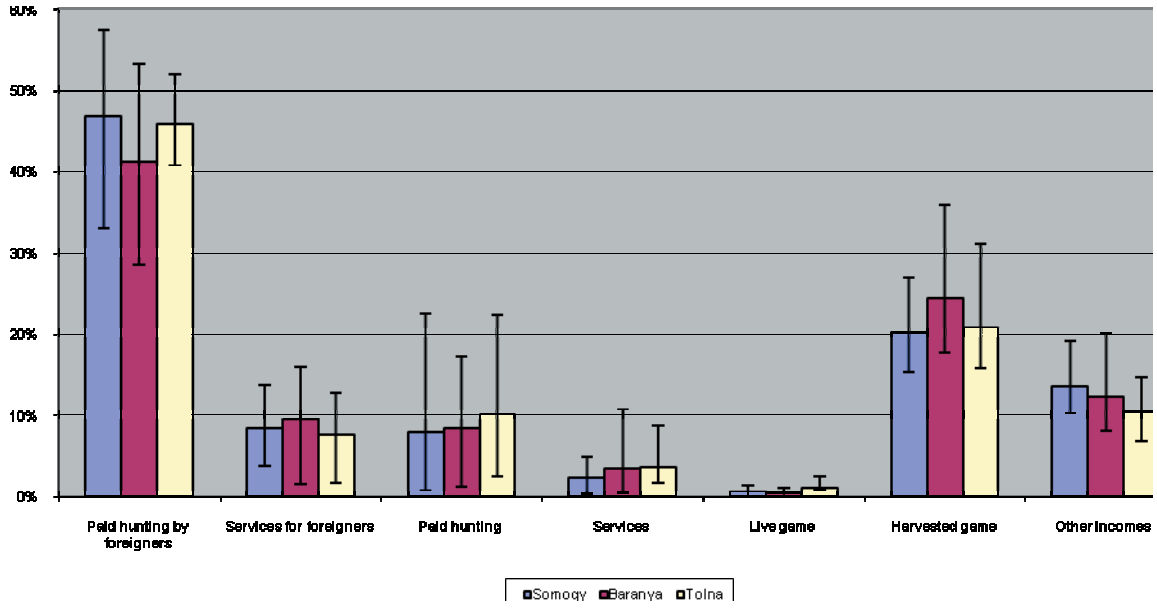

Figure 2: The average, max. and min. incomes rate of game management in South-Transdanubian Region counties between 1994-2005 without resources gained by tenders and subsidies

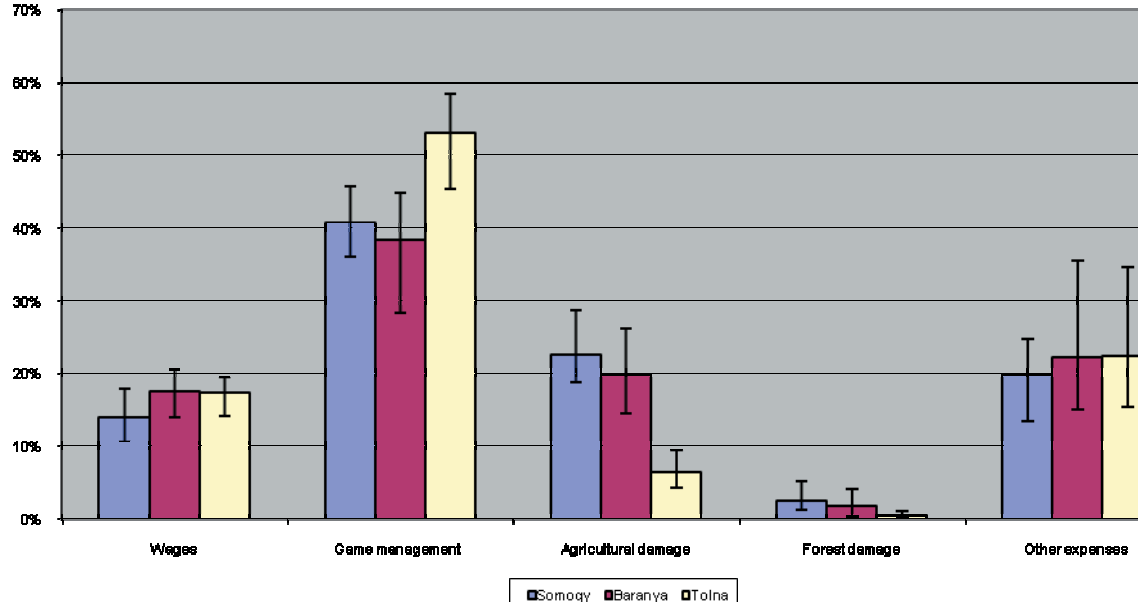

Figure 3: The average, max. and min. expenses rate of game management in South-Transdanubian Region counties between 1994-2005

In average, the forest damage was 3% in Somogy County, 2% in Baranya County and only 0.6% in Tolna County.

The average of the other expenses was 20% in Somogy County, and 23-23% in Baranya County and in Tolna County.

The examination of the economic results on current price and considering inflation

From the distinction of the aggregated income and the aggregated expense the sector's economic results can be adjudged (Figure 4). Somogy County was firstly near by the deficit in 1997, and since 1999 it has been showing a deficit in every year, but in 2005 the loss was significantly lower. Although in decreasing degree, Baranya County was profitable till 1999. Firstly it showed a deficit in 2000, after a profitable year, it showed a deficit in 2002, 2003 and 2004; while it became profitable again in 2005. Tolna County's situation is the best, because its profit decreased until 2001 and its hunting activity showed a deficit only in 2003.

The figure of the incomes and expenses (Figure 5) show well, that Somogy County's incomes and expenses are much higher than in the other two counties of the South-Transdanubian Region. In Baranya County, both the revenues and the expenses have been declining year by year since 2001.

Considering the inflation (Figure 6) it is apparent that Somogy County could not follow it in its revenues (Figure 6), opposite to Baranya and Tolna County. Instead of expressing the changes in relative numbers (e.g. percentage of change between the first and last years of the analysed period) I use the parameter "a" of the trend lines, which give information on the average change during the whole period. The rise of the revenue's trend is the biggest in Baranya County (a=2317), in Tolna County it is at a low level (a=-1661), while in Somogy County it is strongly decreasing (a=-13767).

The increase of the expenses (Figure 7) exceeds the inflation in all of the three counties (Figure 7). In Somogy County the costs increased at a lower rate (a=1252) than in Tolna County (a=4293). The increase of costs is mostly feature to Baranya County (a=9360).

The slope of the balances' trend-lines is negative everywhere. The slope is the smallest in Tolna county (a=-5955), while it is the biggest in Somogy County (a=-15019), the rise in Baranya County is –7043.

Examination of specific figures

I exteriorized the data of the aggregated income, the aggregated expense and the result (balance) to the three counties' bearing surface and forest surface unit (Table 1). The arable area of county Somogy is 4868.17 km^2 it is 3757 km^2 in Baranya and 3037.32 km^2 in Tolna. Somogy has 1613.91 km^2 forest area, Baranya 1038.2 km^2, and Tolna 462.98 km^2.

According to the specific figures the income per square kilometre is the highest in Somogy County, but the expense is much higher than in the other two counties.

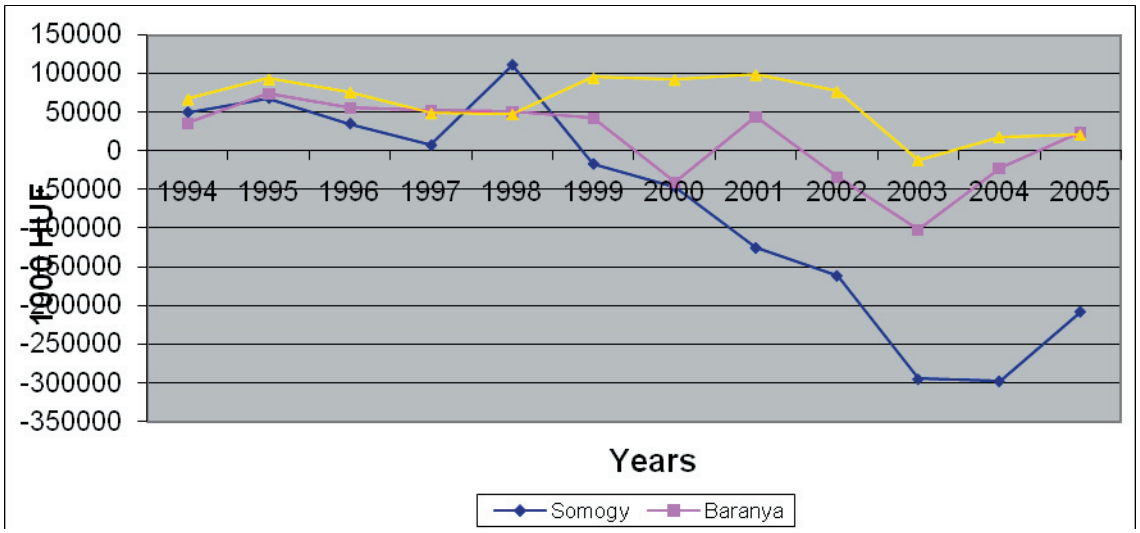

Figure 4: The game management balances of South-Transdanubian Region counties between 1994-2004 without resources gained by tenders and subsidies

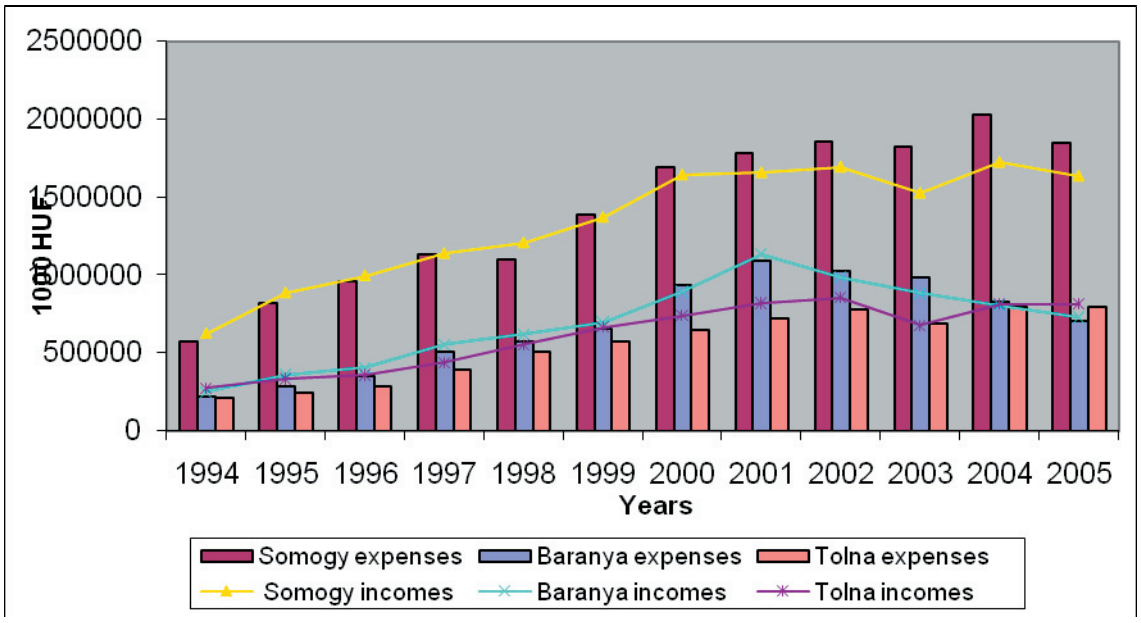

Figure 5: The summarized game management incomes and expenses of South-Transdanubian Region counties in current prices between 1994-2004 without resources gained by tenders and subsidies

The expenses of Tolna and Baranya counties fluctuate together but after 2000 Baranya County has lower and lower specific expense. Although Tolna County is the most successful in the region, its balance shows further decreasing tendency.

The rates exteriorized to the forest area are naturally higher, but the tendency is the same as the ones expressed to the whole surface. Baranya County realized the smallest revenue. With the exception of one year (2001) Somogy County's revenues were always higher than those of Baranya County. The revenue per square kilometre of forest was the biggest in Tolna County, but the percentage of forest area is the smallest here.

Considering the aggregate expenses, these increased mostly in Tolna County. The specific cost per square kilometre of forest was the smallest in Baranya County.

Analysing the economic results, we can see that Tolna County's management was the most efficient per forest surface unit. Despite the deficit year it produced the multiple than the region's other two counties; but the percentage of forest area is much smaller. But the balance's trend line has negative rise, which shows that the game management's provisos fall off too in the county with the most efficient management.

The big game unit(BGU)

I compared the big game incomes to the red deer incomes. The calculated rates: the value of 1 BGU suit for the value of 1 red deer, 2.65 fallow deer, 4.04 roe deer and 3.29 wild boar. One big game unit's value signified in money is 119 400 HUF. The aggregated bag values converted with the rates are shown in Table 2.

The applied method must be right because the average of the rate's per cent distribution for 2003 is 100%, because the rate calculated for the game unit was conducted from the revenues (Table 3).

Some coherence already partly known can be compared deeper. Therefore for example the revenue from the paid hunting by domestics and foreigners was higher in Tolna County and Baranya County, but the value added (services) was the highest in Baranya County. In case of the other incomes there is no important difference. Accordingly, Somogy and Tolna County should exploit their hunting

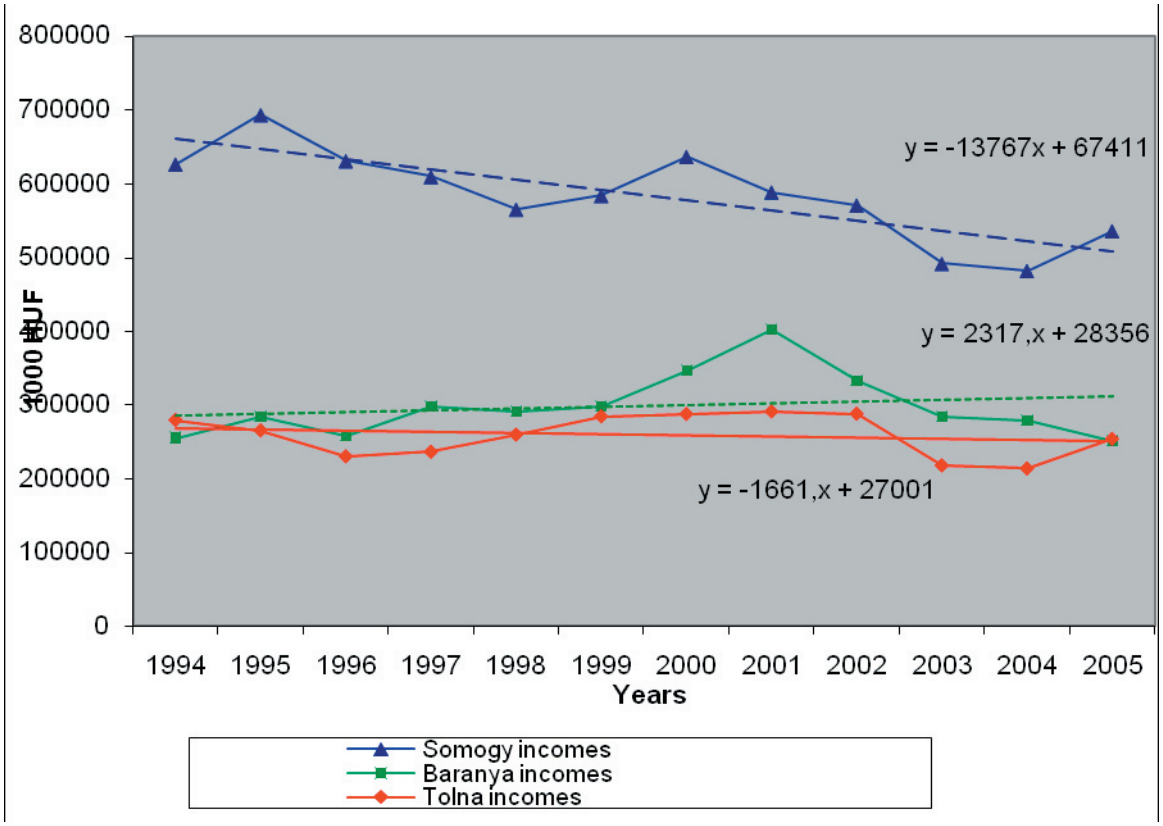

Figure 6: The summarized game management incomes and trends of it in the South-Transdanubian Region counties adjusted with inflation between 1994-2005 without resources gained by tenders and subsidies

potential with the expansion of the services.

The wages are the highest in Tolna County, but the difference is not significant. The game management costs expressed in percentage of a big game unit value are very high in every county. In Somogy and Tolna it is equally 56%, in Baranya County 13% less is spent. The agricultural damage is very high in Somogy and Baranya County, nearly 30%. while in Tolna County it is only 6%! The forest damage's rate is not so big: 0.6-3.5%. The other expenses are the highest in Tolna County, and nearly the same in the other two counties (Table 4).

The total expenses show that to produce one big game unit costs 15% more in Somogy County than in Tolna County, while its revenues are lower. Baranya is in the most favourable position from the expense side, but the incomes are lower than in the other two counties.

From the analysis of the economic result (balance) it can be established that the production of one big game unit generates 20% deficit in Somogy County 10% in Baranya County while 2% in Tolna County.

In the 2004-2005 hunting year the figures were more favourable in the whole region; the biggest improvement was seen in Baranya County (8%). In Somogy County, every big game unit makes 19% deficit, in Baranya County 'just' 2 %, while in Tolna County there was 3% profit. In Somogy County 1% improvement was seen, despite the increasing deficit. It can be explained by that the bag converted to big game unit increased at a bigger rate; it was 132 51 BGU.

The economic indicators improved in the 2005-2006 hunting year. In Tolna and Baranya Counties the profit was 3% BGU, while in Somogy County the 15% deficit is 4% better than in previous year.

CONCLUSIONS

The profitability of the game management decreased during the period analysed in the three counties of the South-Transdanubian Region involved in the study, which corresponds with the national tendency. In year 2003, the sector closed with deficit in the three analysed counties, as well as nationwide according to relating literatures.

Despite that agricultural damages (representing the highest share in game management costs) showed a low level in county Tolna due to its spatial conditions, the game management suffered losses. In Somogy and

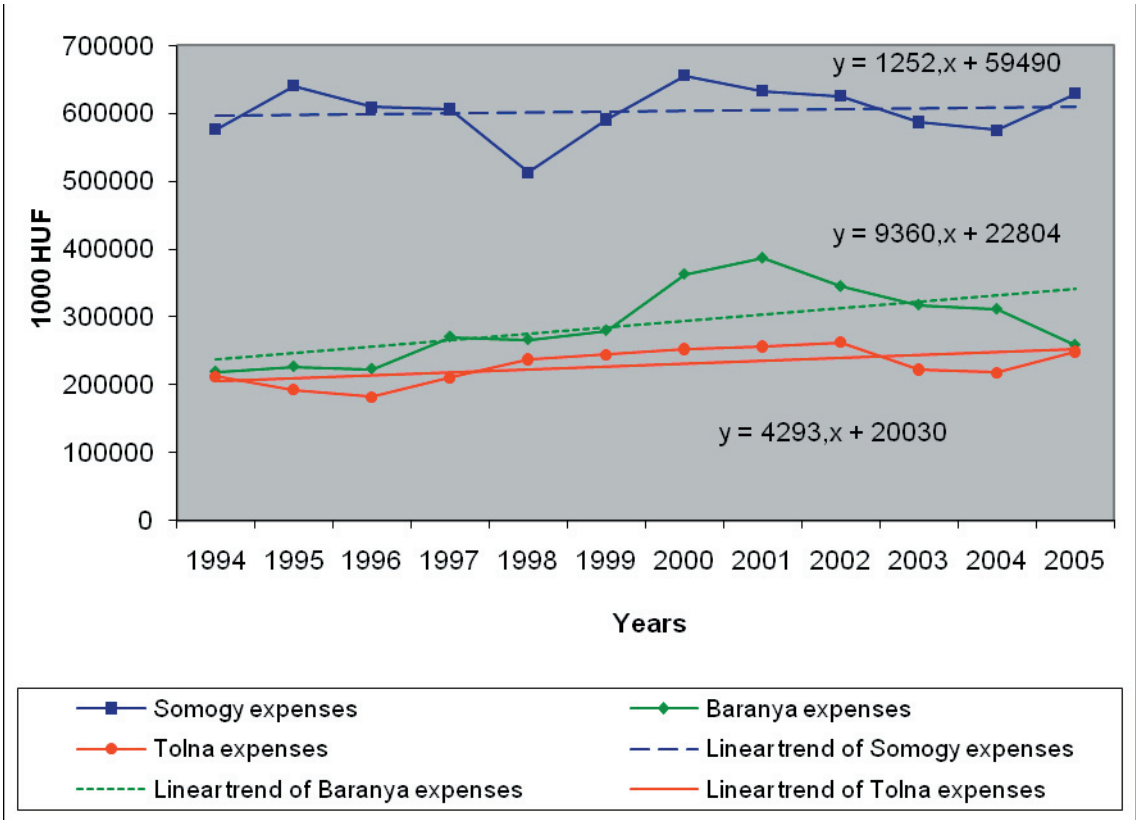

Figure 7: The summarized game management expenses and trends of it in the South-Transdanubian Region counties adjusted with inflation between 1994-2005

Table1: The summarized game management incomes, expenses and balances per crop land and forest area of South-Transdanubian Region counties between 1994-2005 (1000 HUF/km^2)

County	Year	Total incomes		Total expenses		Balance	
		Crop land area	Forest area	Crop land area	Forest area	Crop land area	Forest area
Somogy County	1994	128.7	388.2	118.4	357.0	10.3	31.1
	1995	182.6	550.7	168.5	508.3	14.1	42.4
	1996	205.4	619.5	198.1	597.5	7.3	22.0
	1997	234.7	707.9	233.1	703.2	1.6	4.7
	1998	248.8	750.3	225.8	681.2	22.9	69.1
	1999	282.6	852.4	286.0	862.7	-3.4	-10.3
	2000	338.5	1021.1	348.0	1049.7	-9.5	-28.5
	2001	341.6	1030.5	367.4	1108.1	-25.7	-77.6
	2002	349.0	1052.7	382.2	1152.7	-33.2	-100.0
	2003	314.6	948.9	375.2	1131.7	-60.6	-182.8
	2004	355.3	1071.8	416.5	1256.2	-61.2	-184.5
	2005	336.9	1016.2	379.6	1144.9	-42.7	-128.7
Baranya County	1994	67.9	245.9	58.3	210.8	9.7	35.1
	1995	97.0	350.9	77.3	279.7	19.7	71.2
	1996	108.8	393.6	94.0	340.3	14.7	53.3
	1997	149.0	539.1	135.0	488.4	14.0	50.7
	1998	165.8	600.1	152.1	550.5	13.7	49.5
	1999	186.8	676.0	175.5	635.2	11.3	40.8
	2000	239.2	865.4	249.9	904.2	-10.7	-38.8
	2001	302.8	1095.6	290.9	1052.6	11.9	43.0
	2002	264.2	956.2	273.1	988.5	-8.9	-32.3
	2003	236.1	854.6	263.2	952.6	-27.1	-98.0
	2004	215.9	781.4	221.9	802.9	-5.9	-21.5
	2005	195.4	707.3	189.0	683.8	6.5	23.4
Tolna County	1994	92.1	604.1	69.9	458.6	22.2	145.5
	1995	112.1	735.4	81.4	533.8	30.7	201.6
	1996	120.3	788.9	95.1	624.1	25.1	164.8
	1997	146.1	958.5	129.9	852.0	16.2	106.5
	1998	183.3	1202.2	167.4	1098.5	15.8	103.7
	1999	220.9	1449.0	189.5	1243.3	31.4	205.7
	2000	245.2	1608.5	214.7	1408.2	30.5	200.3
	2001	270.9	1777.4	238.3	1563.2	32.6	214.1
	2002	282.3	1852.0	256.9	1685.3	25.4	166.7
	2003	223.9	1468.8	228.0	1495.8	-4.1	-27.0
	2004	269.9	1770.7	263.9	1731.3	6.0	39.5
	2005	270.0	1771.2	263.0	1725.6	6.9	45.6

Baranya Counties additional sources should been ensured for prevention and decrease of the damages caused by game (wild crop land cultivation, prevention hunting).

In case of the revenues the offered services should been developed in Tolna and Somogy Counties; they have unused spares compared to Baranya County.

The sector can not eliminate the effect of inflation, as the higher revenues from domestic hunting compensated only a part of the lost revenues from foreign guest shooting. In addition, in order to keep the guest hunters, the changes of game prices (shooting, venison) did not follow the rate of inflation. Another negative effect was that the HUF/Euro exchange rate has been unfavourably fluctuating.

For exact financial analyses the balance sheets and profit and loss accounts should be collected from hunting companies. It is however complicated because game management companies with various legal forms are eligible for hunting; and these have varying forms of financial statement commitments.

The introduced so-called big game unit is able for the

Table 2: Bag data (original and converted to BGU) in 2003/2004 hunting year (pieces)

Game species	Original bag			Bag converted to BGU		
	Somogy	Baranya	Tolna	Somogy	Baranya	Tolna
Red deer	7404	5173	2523	7404.0	5173.0	2523.0
Fallow deer	3041	161	1794	1147.5	60.8	677.0
Roe deer	4811	3799	3411	1190.8	940.3	844.3
Wild boar	8821	6683	4386	2681.2	2031.3	1333.1
Total	24077	15816	12114	12424	8205	5377

Table 3. Incomes per BGU and percentage of income in BGU value in 2003/2004 hunting year (1000HUF/BGU; % of BGU value)

County	Paid hunting by foreigners	Services for foreigners	Paid hunting	Services	Live game	Harvested game	Other incomes	Total incomes
Somogy	56.4	6.6	17.5	3.2	1.5	19.7	18.4	123.3
Baranya	33.9	14.2	14.8	11.6	0.5	19.1	14.0	108.1
Tolna	58.2	2.6	22.4	5.6	1.4	20.0	16.3	126.5
Somogy	47%	6%	15%	3%	1%	16%	15%	103%
Baranya	28%	12%	12%	10%	0%	16%	12%	91%
Tolna	49%	2%	19%	5%	1%	17%	14%	106%

Table 4. Expenses per BGU and percentage of expenses in BGU value in 2003/2004 hunting year (1000HUF/BGU; % of BGU value)

County	Wages	Game management	Agricultural damage	Forest damage	Other expenses	Total expenses	Balance
Somogy	21.6	67.2	34.8	3.5	19.9	147.0	-23.7
Baranya	18.6	51.5	31.5	0.6	18.3	120.5	-12.4
Tolna	22.2	67.1	7.6	1.0	30.9	128.8	-2.3
Somogy	18%	56%	29%	3%	17%	123%	-20%
Baranya	16%	43%	26%	0%	15%	101%	-10%
Tolna	19%	56%	6%	1%	26%	108%	-2%

comparison of the counties' big game management. It would be reasonable to calculate and use the big game unit year by year for the comparison of big game management of different habitats (at level of game management companies, county, region, country). It could help recognising and utilising the comparative advantages of game management.

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