

SZENT ISTVÁN UNIVERSITY
Gödöllő
DOCTORAL SCHOOL OF MANAGEMENT AND
BUSINESS ADMINISTRATION



**THE MAIN CHARACTERISTICS AND IMPACTS OF THE
STRUCTURAL CHANGES OF LAND OWNERSHIP IN OUR
COUNTRY**

THESES OF THE PhD DISSERTATION

Zoltán Ragoncsa

Gödöllő
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1. ANTECEDENTS AND OBJECTIVES OF THE RESEARCH

Soil is the most important natural resource of Hungary. Land ownership, land use and the efficiency of the land utilising system have been in the centre of attention both in the EU and Hungary. Land use and estate structure as well as ownership relations and estate concentration with some other factors significantly influence the success of farming.

Agricultural activities are in direct or indirect relationship with soil. With regard to efficiency ecological endowments and the quality of soil are decisive but ownership relations, the structure of land use and estate as well as estate divisions also influence the outcome.

Land ownership also refers to the right over land. Land utilisation is the use of land for a certain purpose or the direct exercise of ownership or its lease in exchange for something (e.g. fee). The owner is interested in the sensible use of the land by not overexploiting the future conditions of production (sustainable use) although it holds partly true for the tenant.

1.1. The timeliness and significance of the topic

The world's population is increasing rapidly so it is also necessary to increase food production to supply them. Population growth by 2050 is projected to call for a 70-percent-growth in agricultural production.

The structural changes of land ownership affect production. The timeliness of my topic is that increasing the production of the Hungarian agriculture and making use of its potentials is the primary interest of our country when taking global tendencies into consideration. Through it rural resilience, employment and income generation can be improved, as well.

An important issue is that land owners must support green technologies and ways of land use in line with the directives of the National Sustainable Development Framework to preserve biodiversity.

My objective is to point out the reasons for the slow development of agricultural production with special regard to the changes in land use and production structure. To underpin the significance of the topic primary research was carried out on the basis of questionnaires distributed in the individual companies and partnerships of Baranya county. To supplement

and also to get acquainted with the topic in more details in-depth interviews were also conducted.

The target audience of the examination included the managers (owners) of the partnerships of Baranya county. Seventeen in-depth interviews were made in person. The request of the respondent according to which their names and personal particulars should not be disclosed is respected so no reference to them is made in the findings.

1.2. The objectives of the research

At the beginning, the following objectives were formulated:

a.) Objectives to be reached by literature review (secondary research):

Surveying the current Hungarian situation (land ownership, land use and land prices, analysis of tenant farming and exploration of the opportunities of cooperation together with the evaluation of changes at individual companies and partnerships to explore the possibilities of associations and the barriers/hindering factors

b.) Objectives to be reached by primary research:

Presenting the changes of the land market, evaluating tendencies and the current situation of land lease by means of questionnaires and in-depth interviews.

Comparing the situation of sole proprietorships and partnerships and evaluating the situation of the environment by using questionnaires.

Assessing employment by using questionnaires and in-depth interviews.

While analysing data conclusions can be drawn partly from the different aspects of sole proprietorships and partnerships on the one hand, and analysing the structure of the farms, the ratio of their own and rented land as well as the influencing factors by expressing changes numerically.

Primary research based on questionnaires was carried out at the partnerships in Baranya county in line with the objectives stated above to test my hypotheses.

Taking the experience of the literature review into consideration the following research hypothesis were drafted and examined in my dissertation.

1.3. The hypotheses of the research

H₁.

The appreciation of agriculture and agribusiness is expected as a result of global, European and Hungarian processes that result in the rapid growth of the value of land and land lease. The impacts of the land market could assist in creating efficient organisational structures only to a slight extent.

H₂.

The main changes of land use took place till our EU accession. The small-scale changes of the future did not have any proven effects on yields and profitability.

H₃.

The ban on partnerships to purchase land put animal husbandry to an uncertain situation. As a consequence, investments lagged behind the required level and animal husbandry started to continuously lose ground. The proper ratio of sole proprietorships and partnerships can ensure the balance between plant production and animal husbandry.

H₄.

Since our EU accession there has been a decreasing rate of employment due to the decline of labour intensive industries. Although investments and more developed technology is typical of partnerships, sole proprietorships have made great advances in this field.

2. MATERIAL AND METHODS

2.1. The process of the research

Scientific work can also be interpreted as a process of research with the following objectives.

- drafting new scientific problems;
- solving the problems that arise;
- managing the hypotheses arising from the problem;
- making scientific work more efficient.

The research process is a circular phenomenon as new problems arise that have to be solved (Figure 1).

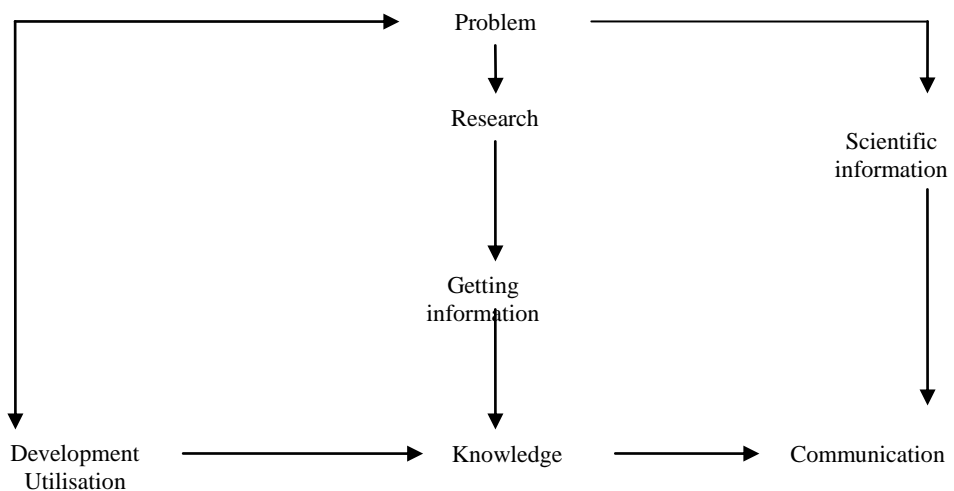


Figure 1 **Research as a circular phenomenon**

Source: Szűcs, 2008.

According to the academic encyclopaedia research is 'solving a problem by drafting hypotheses and testing them in an inductive or deductive way'. SZÚCS I. (2008) explains: 'From those mentioned above it is obvious that some people regard only the *basic research* as research, i.e. analytical knowledge development while others have a broader sense. They define research as *disciplinary research* that is synthetizing knowledge development and the so-called *applied* research, the combination of the two (analytical and synthetizing problem solving).'

2.2. The databases and methodology of the secondary and primary research

Secondary research

In the process of secondary research the researcher uses the data and the published findings of others. In this case the well-known results serve as the basis for processing. I have also carried out literature review classified by topics.

In the first part of the research I present the theoretical questions and the Hungarian situation of land ownership and utilisation in addition to a short international evaluation. I also make reference to sustainability, which is a key issue when talking about Earth as it is about our future. When presenting land utilisation opportunities are examined and employment is analysed, which is a serious problem in the countryside.

In the research KSH, EUROSTAT, STADAT and AKI databases were used and I had data from 2014 as the final year available.

By using AKI data the large regions (North Hungary, Transdanubia, Great Plains) are examined. The data of the Farm Accountancy Data Network are detailed and the activities of sole proprietors and partnerships can be analysed. Almost 110 000 farms can be studied on the basis of 2000 model farms.

Changes

- in land ownership and land lease;
- asset value trends;
- long-term profits of agricultural enterprises and the income situation and
- investments are analysed.

Primary research

Information was collected by using questionnaires and in-depth interviews; the former ones at the sole proprietorships and partnerships of Baranya county while the latter ones only at partnerships, which have a decisive role in the agricultural production of Baranya county.

Pre-tested questionnaires were used and of the 130 pieces 82 could be assessed and processed, as well.

Mostly closed questions were applied in the questionnaire by which easily assessable and generalizable information was gained. The questionnaire dealt with the following areas:

- project funds and support;
- sources of information;
- form of business;
- number of employees and family members;
- land ownership and land utilisation;
- ratio of owned and leased land;
- sales;
- the environment and production;
- future prospects;
- personal details.

2.3. Statistical methods applied in the research

In research methodology mathematical statistics is decisive. Scientific research is applied to prove or reject the subjective statements and hypotheses of the researchers. The objective statistical methods can confirm research hypotheses (SZÚCS I., 2008).

In the returned questionnaires the data disclosed are evaluated by statistical analysis based on scientific methods. After entering data statistical processing was carried out by SPSS 20.0 programme. Figures and diagrams were prepared by Microsoft Excel.

Uni-and multivariable analyses

By using univariate analyses an answer is sought how the examined cases re spread on a single variable utilised.

Of the univariate analyses the following calculations were applied.

- Distribution

The frequency of respondents' opinions on a concrete question could be surveyed. In such a case it is possible to classify respondents on the basis of certain variables. To this end, so-called separating variables can also be created as a result of distribution analyses such as the age or the gender of the respondents.

- Mean

Mean is typical of a large group of data. The mean is the ratio of the sum of the data and their number.

It is such a reference number alongside which the examined data set deviates. It is also suitable for examining data of interval and ratio scales. It expresses my dataset examined in one number.

- Deviation

Deviation is the variance of the deviation from the average. It shows how much the values divert from the average. Deviation is one of the most important indicators.

The mean value indicators express the sample with a number but they do not measure the dispersion of the items, i.e. deviation from mean. Deviation shows how different or changeable the respondents' opinions are on an issue.

The use of multivariate analysis is important because they make the exploration and explanation of relations between the sub-groups of variables. Of the multivariate analysis used in the quantitative research I primarily employed **non parametric tests**. Such examinations are applied when the spread of the sample diverts from the standard and data are not suitable for parametric tests.

- Kruskal-Wallis test

The objective of the method worked out by W. H. Kruskal and W. A. Wallis in 1952 is to compare the mean of three or more independent samples. The procedure in real is the generalisation and extension of the Mann Whitney test.

If it is the non-parametric equivalent of one-way ANOVA, it can replace ANOVA. If the deviations per group are quite large, the shape of distribution differs and it is also the case if the conditions of normality per group are badly distorted.

It does not call for the normal dispersion of variables but the number of items in the sample should be at least five. Another condition is accidental sampling that ensures that the single variables are evenly spread in case of H_0 , independent samples and variables measured at least on ordinal scale.

H_0 : The medians of groups equal.

H_1 : Of the groups at least the medians of two differ.

It is also termed as rank transformation procedure as after unifying samples the ranks must be defined. In the test the independent samples are unified so a unified common sample is generated that is put in order. Ranks are assigned to the items of the sample and summarised per group (column) and

also the mean of the ranks of the single samples is calculated. If the sample is large enough, i.e. all the samples include at least 5 items, the test statistics marked with H can be calculated.

$$H = \frac{12}{N(N+1)} \cdot \sum (Tx^2 / n_x) - 3(N+1)$$

where n_x = the size of sample x, $N = n_1 + n_2 + \dots + n_x$, i.e. the number of all the groups examined, T = sum of ranks.

$$H = \frac{12}{N(N+1)} \left(\frac{R_1^2}{n_1} + \frac{R_2^2}{n_2} + \dots + \frac{R_k^2}{n_k} \right) - 3(N+1),$$

where n_x = items of sample x, R_x rank sum of sample x, N = sum of the items of samples, i.e. $N = \sum n_x$.

- Confirmatory factor analysis

There are two types of confirmatory factor analysis: the principle component analysis and the common factor analysis. In the examination the cohesion between the original variables is detected. While principle component analysis uses the entire variance, the common factor analysis uses only the common variance. In the analysis new variables and factors are generated of which we do not have information. If we know our variables or the objective is to reach the highest variance proportion explained by using the fewest factors, principle component analysis is practical to use. Factor analysis can also be used if we do not know our variables or there is no information about the extent of unique or error variance. Our objective is to explore the dimensions hidden.

The main point of using the method is to define fictitious, independent background variables instead of the correlated original variables and using them the original characteristics of the units of observation can be replaced by fewer artificial coordinates. By omitting less important information the number of variables is reduced so the causes and effects can be stressed.

The canonical correlation is used to explore the correlations between the two groups of variables and the set of dependent variables is explained by another set. The method defines this relationship through variables not observed. It looks for the linear combination of the set of explanatory variables that explains dependent variables.

2.4. Qualitative method

The in-depth interview is part of qualitative research so it supplies non representative and non-statistical results. Its objective is to understand the issues. Qualitative information makes exploring the deeper correlations possible and the respondents can express their thoughts and feelings on their own.

The respondents of the interviews were the managers of partnerships for whom land ownership and land utilisation are not indifferent issues. In a free discussion the causes and results were explored within about an hour. This method is much looser than the questionnaire so motivations and reasons can better be explained.

During the interview the interviewer uses a guide but the responses of the interviewee influence the wording and the order of the questions. Altogether 17 in-depth interviews were carried out in 2015 and 2016.

3. RESULTS

The chapter includes the evaluation of the most important farm accountancy network database parts, the findings of the questionnaires and the most significant remarks of the in-depth interviews.

In the first part of my research the results of the analyses of literature sources (secondary research) are presented and conclusions are drawn.

3.1. Evaluation of questionnaires

This chapter includes the results of the primary research. The questionnaires were sent out to the sole proprietorships and partnerships of Baranya county and of the 130 questionnaires 82 could be assessed. Evaluation by using SPSS 20.0 programme makes a detailed analysis possible whose scope stretches beyond the limitation of the dissertation so only the most important tables and figures are presented.

3.1.1. Introducing the participants of the questionnaire

Simple accidental sampling was the method used when selecting respondents. Responses were gained from sole proprietors and partnerships. The proportion of males was significantly greater in both groups (Figure 2).

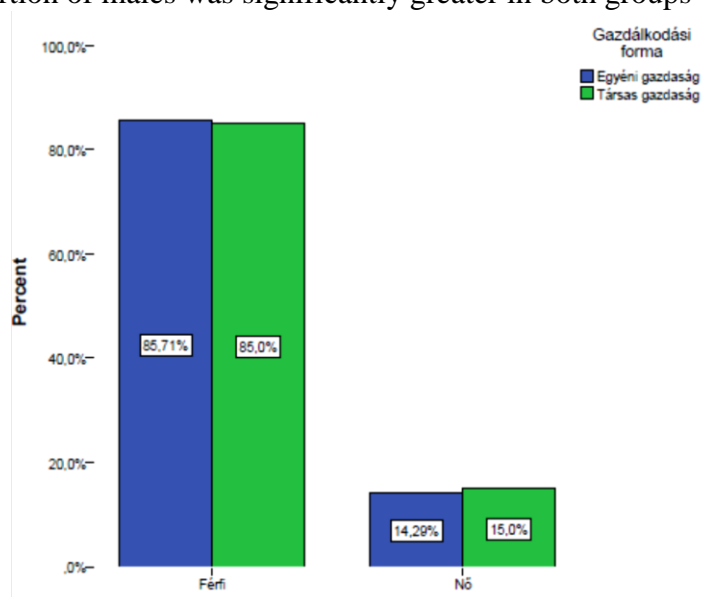


Figure 2 **Breakdown of respondents by gender**

Source: author's own research

Regarding age the elderly dominate (Figure 3).

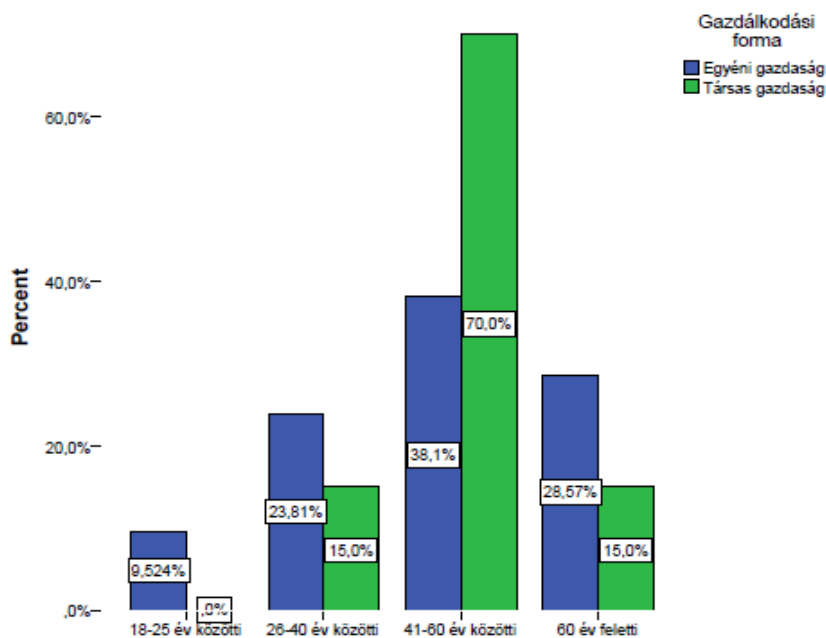


Figure 3 **Breakdown of respondents by age**

Source: author's own research

A timely and important issue is to register the qualification and the type of qualification of the respondents. The managers (owners) of partnerships are highly qualified, which cannot be said about the sole proprietors. Agricultural and economic qualification dominates in partnerships officially engaged in farming and agriculture while sole proprietors are divided from this aspect. Anyway, the conclusion is that special knowledge is urgently needed in sole proprietorships (Figure 4).

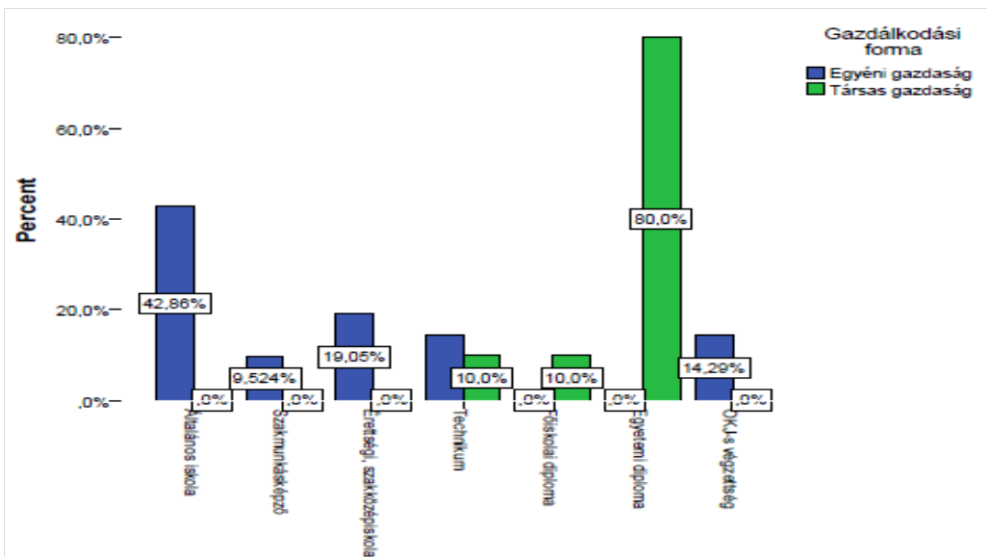


Figure 4 **Breakdown of respondents by qualification**
Source: author's own calculations

3.1.2. Presenting the responses that justify the hypotheses

According to Hypothesis 1 the appreciation of agriculture and agribusiness is expected. Most sole proprietors agree with this statement while opinions differ in partnerships (Figure 5).

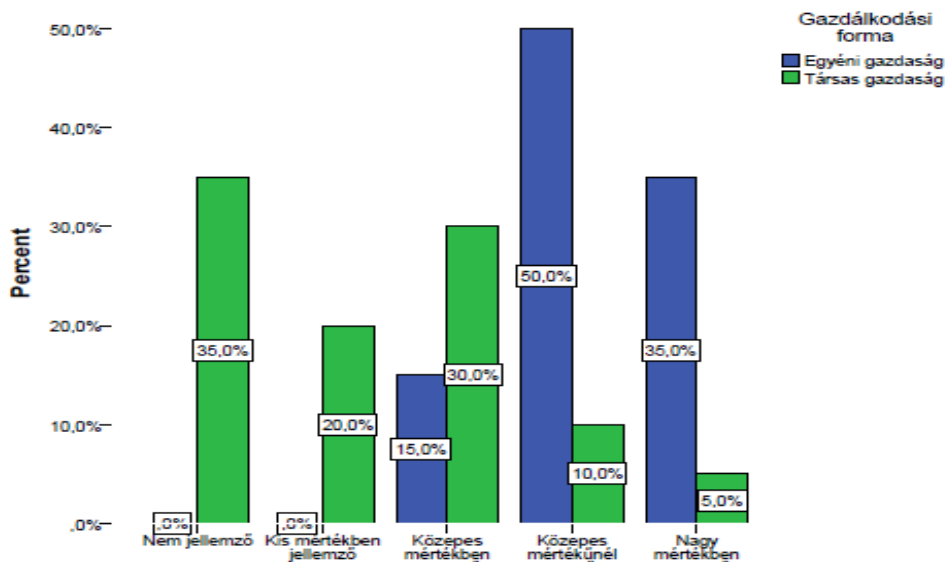


Figure 5 **Changes in the significance of agriculture**
Source: author's own research

3.1.3. The Kruskal-Wallis test on the category of operating profit ratio

Rank order was applied in the examination starting from the smallest to the largest. In the case of successful project application larger support is assigned to larger profit categories. The correlation is strongly significant (Table 1).

Table 1 **Operating profit ratio category**

Test Statistics ^{a,b}							
	No successful project application	Type of industry	Estimated revenue in crop production	Estimated revenue in animal husbandry	Revenue in agriculture	Changes in using artificial fertilizer	Changes in machinery buying
Chi-Square	64,966	8,956	12,421	30,730	27,544	21,565	25,188
df	6	6	6	6	6	6	6
Asymp. Sig.	,000	,176	,053	,000	,000	,001	,000

a. Kruskal Wallis Test

b. Grouping Variable: Operating profit ratio category

Source: author's own calculations

The 82 enterprises of the examination by type are engaged in 1 – plant production, 2 – animal husbandry, 3 – mixed but there was no type 2.

The probability of the nil hypothesis (no correlation) by type of industry as of the last line of Test Statistics table is 17.6% which is above the professionally allowed 5% and even above the rarely acceptable 10% so there is no significant correlation between profitability category and type of industry (Table 1).

When examining the estimated revenue higher proportion of plant production is likely to result in lower profit category. The mean of the first three rank mean is greater than that of the last three and with a 5% error level the correlation is significant.

The proportion of revenue in animal husbandry increases the annual profit stability. Consequently, (the high ratio of crop production can increase profit risk) in the current economic situation the proportion of revenue in animal husbandry and type of industry can result in reducing profit risk (fluctuation) even if it is not towards increasing profit volume.

The correlation is highly significant in the examination so the probability of the nil hypothesis is very low so there is a correlation between the two examined factors.

There is a significantly negative correlation between revenue in agricultural activities and frequency (safety) of profitability. The importance of being active in several industries is stressed by the responses and findings (additional, supplementary activities etc.).

When interpreting the use of artificial fertilizers it must be considered that the great mean rank refers to lower (reduced) fertilizer use when encoding the responses increase was marked by 1 and decrease by 3 (2= no change). Consequently, when profit is weaker (large mean rank) the possibility of nutrition is more modest, as well. This correlation is significant at error level 0.1% (0,001 x 100%), statistically significant.

The same holds true for the relation between expenditure and investment for several years as in fertilizer use, i. e. with weaker profitability investment (machinery) decreases.

Profitability indicators of sole proprietorships and partnerships

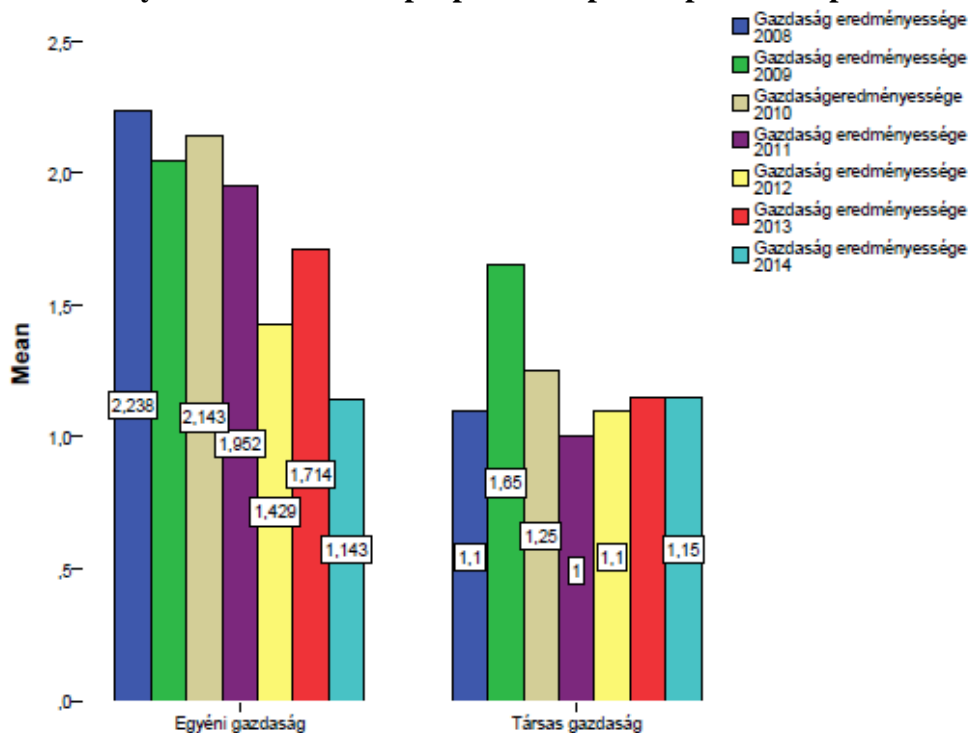


Figure 6 Profitability by form of business

Source: author's own calculations

The code of profitable farming is 1, the ones that made losses is 3. The break-even code is 2, so 2.238 mean can be interpreted in the following way: sole proprietors belong to the break-even category partly and party they incurred losses in 2008 (Figure 6).

The profitability ratios of partnerships were significantly more favourable in each year examined with the exception of the last one, 2014 (examination by form of business).

3.1.4. Factor analysis and the two-sample t-test

The number of variables is reduced in the factor analysis. We try to make the slightest information loss possible. The factors are generated as the linear combinations of the variables transformed. The total variance of the 24 examined variables is 24 of which 79.193% are extracted in the 7 principal component variables.

In the research principal component weights above 0.6 were considered. The analysis is presented by Table 2 that also contains the rotated principal component weights.

Table 2 **Factor analysis**

	Rotated Component Matrix ^a						
	Component						
	1	2	3	4	5	6	7
Growing importance of agriculture	,678	,115	,110	,235	,204	,138	-,289
Scale growth results in more efficient production	,122	,187	,462	,517	,078	,147	-,438
The current production structure does not increase employment	-,028	-,729	-,005	,050	,018	,114	,313
Price increase in land increases the price of agricultural products	-,108	-,111	-,113	-,080	-,128	-,067	,869
Wish to decrease farm	-,288	-,141	-,257	-,134	-,727	-,050	,331
Wish to maintain farm at the same level	,254	-,182	,604	,525	,342	,006	-,065
Wish to increase farm	,524	,073	,190	,155	,457	,296	-,233
Planned cooperation with other producers	,236	-,100	-,151	-,041	-,769	-,355	,002
Products are processed	,095	-,087	-,194	,059	,202	,818	,040
No change in production structure	,723	-,264	,102	-,137	-,139	,101	,270
Increase in arable land	,743	-,022	,189	,378	,173	-,093	,019
Increase in horticulture	,618	,211	,179	,478	,246	-,160	,207
Investment in animal husbandry	-,016	,918	,045	,034	,053	-,124	-,009
Increase in crop production	,055	,912	,052	,195	,052	-,010	,026
Biomass products for energy	,157	-,200	,194	,263	,192	,656	-,261
Supplementary, extra activities	-,405	-,607	-,195	,064	,317	-,265	-,031
Price increase in land helps close non-viable farms	,769	,156	,054	,346	,041	,003	-,191
Increase in land rental fee reduces revenue	-,775	-,171	-,017	-,024	,086	-,392	,318
Changes help cooperation between farms	,098	,388	,635	-,267	,102	,347	,034
Changes induce investments	,428	,102	,048	,688	-,028	,389	,059
Higher ownership ratio results in more profitable farming	,229	,044	-,123	,910	-,040	,079	-,152
Production on both own and leased land	,111	-,028	,848	,217	-,017	-,147	,044
Sustainability is concerned on both own and leased land	,150	,103	,833	-,180	-,002	-,026	-,255

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

Source: author's own calculations

The method of principle component analysis was used to explore the background variables of correlations. The analysis also reflects the relative similarity of opinions in addition to professional statements and interpretations. The opinions of the respondents logically show tighter correlations. They are illustrated by principle component variables as background variables that unify the more significant correlations.

The analysis also reflects the relative similarity of opinions in addition to the professional findings.

The respondents' opinion on the situation of agriculture and their plans concerning farming and changes in the structure of production were examined by principal component analysis based on the 24 responses of question groups 25, 26, 27 and 32. Question group 25 surveys the situation of agriculture, 26 the plans about farming, 27 the planned changes in the production structure while 32 is about the changes in the land market. The system of relations between the 27 variables is expressed properly by the 7 principal component variables.

The respondents' opinions show a logically strong correlation. The background variables of the principal component illustrate the most significant correlations. Table 2 presents the correlation between the main component and the original variables. The first principle component is aimed at enhancing the economy, especially arable land, horticultural production and product processing in line with the growing significance of agriculture.

The second principle component signals opinions according to which the current production structure does not increase employment and also it contains the growing investments in feed production and animal husbandry. Supplementary, extra activities primarily serve employment on the one hand, and growing profitability on the other hand. This assessment justifies hypothesis H₈.

The third principal component includes the possibilities of maintaining the same standard of farms and cooperation between farms. Respondents agree on the same production conditions and the necessity of sustainability on both own and leased land.

As a result of land market changes, scale increase, more efficient production and more profitable farming together with investments assist according to the correlation between the fourth principal component and the original variables (hypothesis H₇).

Some respondents believe in farm reduction as a solution but it should be made more efficient with strengthening producers' cooperation according to the coefficients of the fifth principal component (hypothesis H₂).

In the following principal component product processing and biomass production for energy are partly regarded as objectives. The seventh

principle component variable signals the correlation between land price rise and the price rise of agricultural products.

Two-sample t-test

Comparing sole proprietorships and partnerships

The differences between the profitability level of sole proprietorships and partnerships are strongly significant. Operating profit rate is a percentage so scale-like two-sample t-test can be used to test the differences instead of the Kruskal-Wallis test that can be applied to category variables. The values are reflected by Table 3 and Table 4.

Table 3 **Group statistics**

Group Statistics					
Type of business		N	Mean	Std. Deviation	Std. Error Mean
Operating profit rate	Sole proprietorships	42	37,4150	15,11607	2,33246
	Partnerships	40	87,1429	15,10473	2,38827

Source: author's own calculations

Table 4 **Presenting significance**

Independent Samples Test										
		Levene test equality variance		t-test equal means						
		F	Sig.	t	df	Sig. (2-tailed)	Std. deviation	Std. error mean	95% confidence interval difference	
									lower bound	upper bound
operating profit rate	hypothetical equal variance	,094	,760	-14,896	80	,000	-49,72789	3,33835	-	-43,08436
	non hypothetical equal variance			-14,896	79,811	,000	-49,72789	3,33829	56,37143	-43,08424

Source: author's own calculations

3.1.5. Variance analysis

The examination of the operating profit rate and the amount of funds won by project application by using two-way variance analysis

The monetary categories of applications and the average amounts are presented by Table 5.

Table 5 Data on correlations

Descriptives								
Operating profit rate								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
up to 1 million Ft	10	28,5714	19,04762	6,02339	14,9456	42,1973	14,29	57,14
between 2 and 3 million Ft	16	33,9286	10,26850	2,56713	28,4569	39,4003	28,57	57,14
between 3 and 10 million Ft	8	42,8571	10,79898	3,81802	33,8290	51,8853	28,57	57,14
between 10 and 30 million Ft	14	63,2653	22,21225	5,93647	50,4403	76,0903	28,57	100,00
over 30 million Ft	34	88,2353	14,27298	2,44780	83,2552	93,2154	57,14	100,00
Total	82	61,6725	29,17165	3,22147	55,2628	68,0822	14,29	100,00

Source: author’s own calculations

There is a strong significant correlation between the two examined factors (Table 6).

Table 6 Significance

ANOVA					
Operating profit rate					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	50129,867	4	12532,467	51,330	,000
Within Groups	18799,949	77	244,155		
Total	68929,816	81			

Source: author’s own calculations

The higher profit rate usually goes along with gaining higher amounts of application (Figure 7).

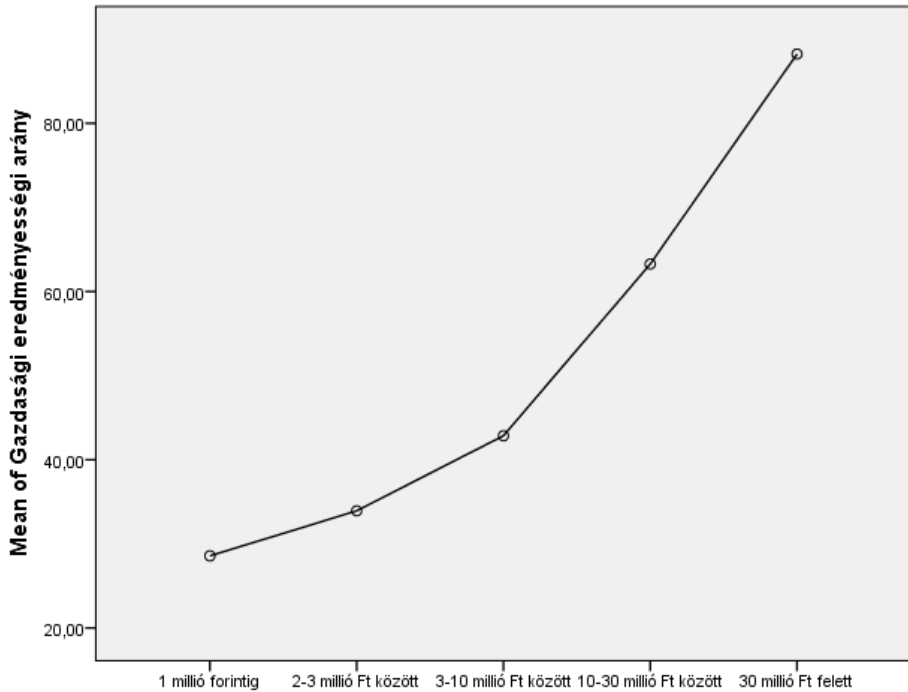


Figure 7 Correlation between operating profit rate and gained project application funds
 Source: author's own calculations

3.1.6. Canonical correlation

The canonical analysis of variable groups 28, 29, 30 and 32

Canonical correlation is a double factor analysis. It calculates factor variables per a group of variables and their correlation is shown by the correlation between these background variables. Correlation between six factors is significant below 0.1% standard rate and their correlations are presented by Table 7. They are above 0.55%.

Table 7 Values of canonical correlation calculation

Eigenvalues:

	F1	F2	F3	F4	F5	F6	F7
Eigenvalue	0,917	0,837	0,654	0,550	0,458	0,300	0,219
Variability (%)	23,307	21,277	16,624	13,970	11,631	7,633	5,557
Cumulative %	23,307	44,585	61,209	75,178	86,809	94,443	100,000

Lambda	F	DF1	DF2	Pr > F
0,001	6,865	119	388,1364	< 0,0001
0,007	4,875	96	341,0848	< 0,0001
0,046	3,503	75	291,6061	< 0,0001
0,133	2,901	56	239,4503	< 0,0001
0,296	2,401	39	184,3431	< 0,0001
0,547	1,851	24	126	0,016
0,781	1,629	11	64	0,112

Canonical correlations:

F1	F2	F3	F4	F5	F6	F7
0,958	0,915	0,809	0,742	0,677	0,548	0,468

Source: author’s own calculations

The r square of Table 8 „Correlations between input variables and canonical variables (Y1)” shows the contribution of the original variable to the factor variable (determining coefficient).

Table 8 Correlations between input variables and canonical variables (Y1)

Correlations between input variables and canonical variables (Y1):

	F1	F2	F3	F4	F5	F6	F7	
Y11	-0,570	-0,647	0,030	0,251	0,155	0,167	-0,155	Land lease means capital extraction
Y12	-0,474	-0,587	-0,176	0,222	0,068	0,109	0,024	Lease results in legal uncertainty
Y13	-0,517	-0,546	-0,028	-0,262	0,285	0,233	-0,273	Rental fee generates price rise
Y14	-0,876	-0,087	0,075	-0,048	-0,257	-0,173	-0,190	Leased land lacks development
Y15	-0,879	0,076	-0,147	-0,017	0,028	-0,120	0,004	Soil is degraded
Y16	0,452	0,092	0,060	0,000	0,244	-0,411	0,151	Ecological production planned on leased land
Y17	0,781	-0,109	0,149	-0,197	0,006	-0,360	0,285	Manuring planned on leased land
Y18	0,687	-0,171	0,057	-0,380	-0,270	-0,203	0,144	Artificial fertilisation planned on leased land
Y19	-0,206	0,086	-0,256	0,003	-0,213	-0,050	0,306	Irrigation system planned on leased land
Y110	0,702	-0,156	0,206	-0,189	-0,202	0,158	0,210	Crop rotation planned on leased land
Y111	-0,279	0,277	-0,002	-0,386	-0,208	-0,043	0,541	Other investments planned on leased land
Y112	-0,165	0,087	-0,255	0,216	0,523	-0,075	-0,087	Ecological production planned on own land
Y113	0,127	-0,044	-0,040	0,476	0,445	-0,150	0,093	Manuring planned on own land
Y114	-0,030	0,065	0,332	-0,288	0,052	0,106	0,274	Artificial fertilisation planned on own land
Y115	-0,036	-0,055	-0,655	-0,113	-0,014	-0,189	0,412	Irrigation system planned on own land
Y116	0,043	-0,227	-0,163	0,036	0,161	-0,322	0,224	Crop rotation planned on own land
Y117	-0,122	-0,001	-0,458	-0,366	-0,281	-0,016	0,291	Other investments planned on own land

Source: author’s own calculations

As an impact of variable group 28 expressing the effect of land lease the farming considerations on both leased and own land (variable group 29 and 30) were put in the first group of correlation analysis. Based on the relatively significant coefficients it can be stated that the drawbacks of land lease are acknowledged.

When applying technological factors prevailing and effective in the short term there is no difference between own and leased land so maturing, fertilising, crop rotation are also typical of leased land but in terms of the irrigation system and ecological production lease is a disadvantage and serious investments are not made on leased land by the farmers.

The seven parts of variable group 32 express the changes of the land market and their effects (Table 9).

Table 9 Correlations between input variables and canonical variables (Y2)

Correlations between input variables and canonical variables (Y2):

	F1	F2	F3	F4	F5	F6	F7	
Y21	-0,892	-0,162	-0,078	0,315	-0,252	0,056	0,078	Land price rise helps close non-viable farms
Y22	0,734	-0,278	0,342	-0,229	-0,420	0,059	0,187	Land lease rise decreases revenue
Y23	-0,598	-0,513	-0,016	0,099	0,421	-0,265	0,348	Changes promote cooperation between farms
Y24	-0,852	0,196	0,199	-0,307	0,244	0,171	0,114	Changes generate investment
Y25	-0,842	-0,415	0,228	-0,004	-0,128	0,000	-0,223	Higher ownership ratio results in more profitable farming
Y26	-0,218	0,290	0,536	0,412	-0,158	-0,555	0,280	Production on both own and leased land
Y27	-0,253	0,260	-0,159	0,157	-0,179	-0,827	0,320	Sustainability on both own and leased land

Source: author's own calculations

When interpreting the variables of „Correlations between input variables and canonical variables Y2” variable group the increase of ownership rate has a favourable impact on profitability, investments and cooperation between farms (hypotheses H₅ – H₇).

The respondents use the same technology in producing both on own and leased land, they take sustainability into consideration but, of course, lack of investments (such as irrigation system, melioration) efficiency is different in these two areas and leased land lags behind.

The coefficients expressing the correlations between canonical variable groups are presented by Figure 8.

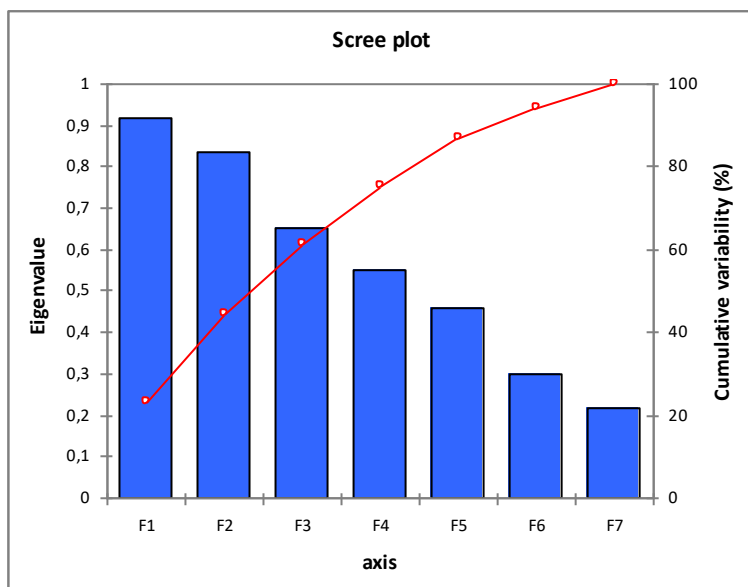


Figure 8 **Coefficients expressing the correlations between canonical variable groups**

Source: author's own calculations

3.2. Introducing and evaluating in-depth interviews

In the in-depth interviews the previously raised and partly confirmed hypotheses of mine on the basis of literature review and questionnaires are to be tested. They are the following.

- the value of land and land lease increase quickly;
- the producers' cooperation is insufficient and not well-planned;
- since 1998 crop rotation has been distorted and crop production rules;
- extensive land lease is disadvantageous;
- there is an increase in area for certain owners;
- animal husbandry is continuously losing ground;
- intensive mechanisation results in lower employment rate;
- owners of few hectares do not produce and rural self-sufficiency is dying.

The target group of the examination consisted of the managers (owners) of partnerships in Baranya county. Altogether 17 in-depth interviews were conducted in person in the farms.

Recording and analysing the interviews

In-depth interviews were conducted between November 2015 and May 2016 in the farms concerned. They lasted one and a half hours where first of all a friendly atmosphere was created.

After consent the interviews were recorded. The questions are thematic and guided but there was room for free selection and giving more details.

The first part of the interview was about the general data of the respondents (gender, age, qualification, skills), then we discussed the issues on land and enterprises. The summarised data of the responses are also illustrated by figures.

Introducing respondents and the descriptive statistics of responses

The analysis starts with presenting the responses to general questions. In the following analysis all the 17 respondents yielded assessable results so responses are presented individually. There were 14 male (82.35%) and 3 female (17.65%) respondents. This ratio suggests that men dominate agriculture.

Regarding age the ratio of those between 41 and 60 was the highest (12), those of above 60 is also high (3) while the young are not typical here (between 126 and 40 only 2). Ensuring successors to this profession is only partial.

Regarding qualification agriculture dominates and economists are also represented in a large number (Figure 9).

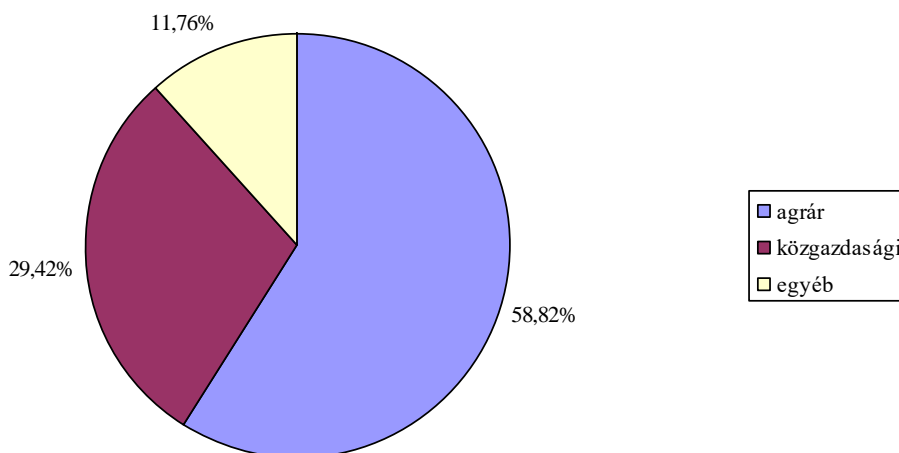


Figure 9 Breakdown of respondents by qualification

Source: author's own editing based on in-depth interview analysis, 2016.

Twelve respondents lived in a village (70.58%) while 5 in the town (29.41%).

The impacts of land price rise are also examined. In Hungary there are a significant number of non-viable micro farms, which is quite typical of Baranya county. Their slow retreat is inevitable and elderly producers are only partly substituted by the young. The situation is not favourable as stopping local supplies and self-supply also propels rural population to cities by reducing rural employment. The breakdown of respondents is also significant here (Figure 10).

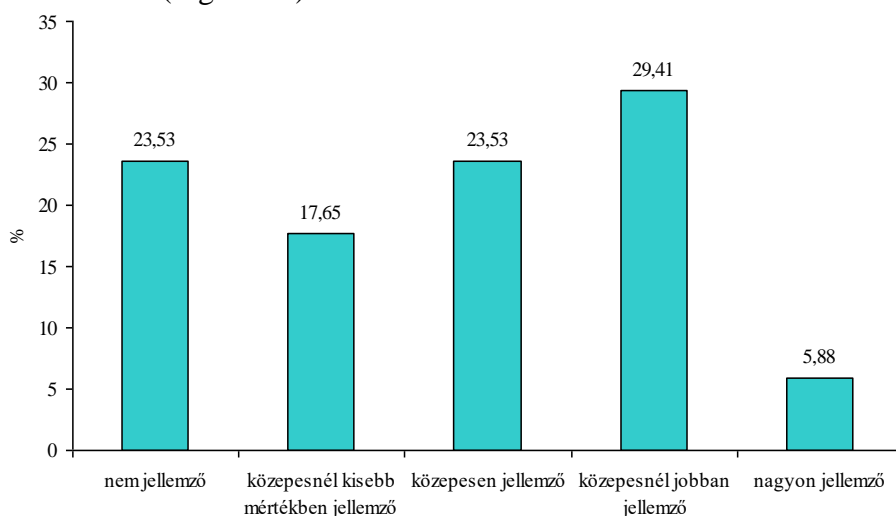


Figure 10 Increase in land price helps cease non-viable farms

Source: author's own editing based on in-depth interview analysis, 2016.

Partnerships practically cultivate leased land. An important issue for them is to decide whether lease fee rise reduces revenue.

Another similar issue is if land lease means capital extraction. The 'very typical' answers dominate so land lease is not judged to be good by the majority (Figure 11).

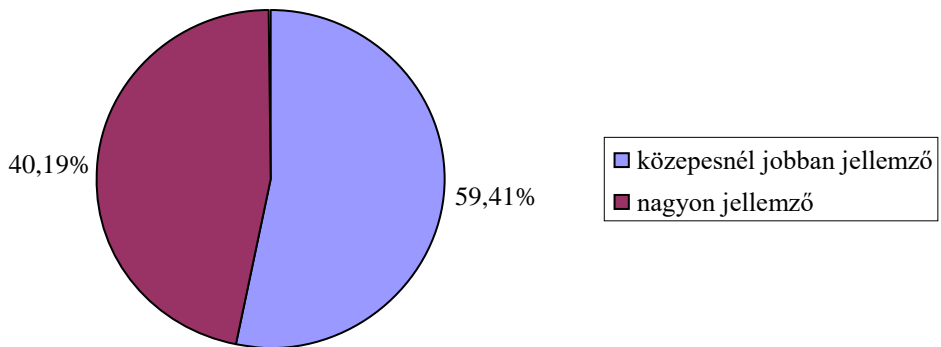


Figure 11 Land lease means capital extraction

Source: author's own editing based on in-depth interview analysis, 2016.

Concerning developments it is not indifferent whether producers cultivate their own land or lease it. Many say that developments are moderate on leased land as the future is uncertain.

Respondents rather prefer lack of developments (Figure 12).

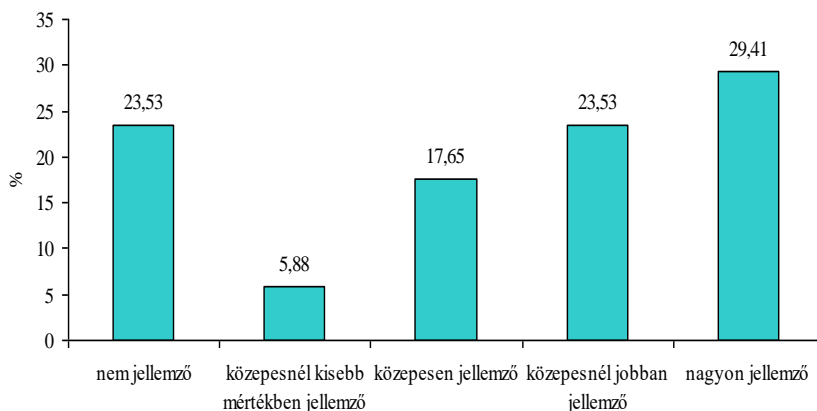


Figure 12 Developments lag behind on leased land

Source: author's own editing based on in-depth interview analysis, 2016.

The partnerships of the county are relatively large and when examining the economic size of farms all of them are in the production value category of above 75 million forint. The ban on land acquisition by partnerships is not considered fair and rejected by all respondents.

Nowadays mechanisation is a decisive factor in production. Opinions show the increase in mechanisation, which is a good thing. Producers usually buy machines when purchase is linked to discount sales. Increasing mechanisation also proves that production is diverted to plant production, which is not at all favourable for employment.

It was suggested that land provides fewer and fewer people with higher revenue (Figure 13).

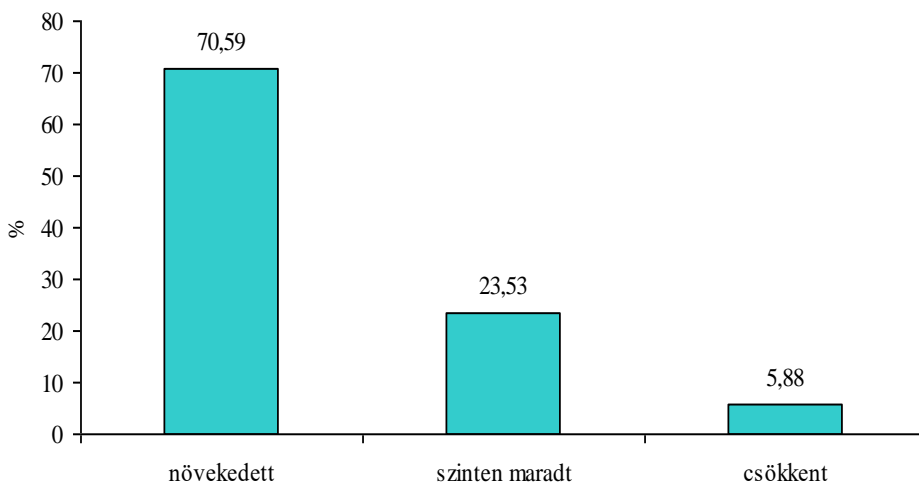


Figure 13 Opinions on buying machinery

Source: author's own editing based on in-depth interview analysis, 2016.

An important issue is whether recent technological development, new species, optimal nutrient supply and favourable weather made the volume of trade growth possible. The responses are obviously positive.

When analysing the fast growth of land lease all respondents agreed on the rapid growth of land lease fee, which is a negative phenomenon.

One of the most important questions is changing employment. We can state that mechanised and industrialised plant production is able to and willing to employ fewer and fewer people. This is a serious problem in the countryside and the cause for moving the population from village to town and villages becoming isolated and empty.

Conclusions drawn from in-depth interviews

- 82.35% of respondents are male and 17.65% female. Regarding age the greatest category is those of between 41 and 60.
- The managers (owners) of partnerships are qualified people who have a degree in agriculture or economics. The majority (70.58%) live in villages.
- The number of non-viable micro farms has been decreasing with the changing generations and there is a threat of stopping local self-supply with significant land concentration.
- For the majority land lease means capital extraction and they do not think the current regulation fair. The value of land and land lease is rapidly growing.
- Since 1998 crop production has been dominating, this does not enhance employment.
- Animal husbandry is continuously retreating and animal farms generate losses due to lack of support and weak production. Since our EU accession 4000 production farms in animal husbandry have stopped operating and those with the weakest profitability are not included in statistics year by year (KAPRONCZAI et al., 2014). Based on the data a shift in the economic system can be noticed and output per farm is increasing.
- Although it was not a separate issue but lack of cooperation as a disadvantage was frequently mentioned. The opportunities of rural integration are weak and in many places local governments take initiatives but no breakthrough has been reached so far. The negative connotation of 'cooperative' is difficult to cease and there is usually lack of confidence. A great part of food processing units have been closed.

3.3. Summary of accepting or rejecting hypotheses

Now my remarks on hypotheses are made on the basis of secondary and primary research (Table 10).

Table 10 **Testing hypotheses**

Hypothesis	Confirmed
H.1. The appreciation of agriculture and agribusiness is expected as a result of global, European and Hungarian processes that result in the rapid growth of the value of land and land lease. The impacts of the land market could assist in creating efficient organisational structures only to a slight extent.	PARTIALLY
H.2. The main changes of land use took place till our EU accession. The small-scale changes of the future did not have any proven effects on yields and profitability.	YES
H.3. The ban on partnerships to purchase land put animal husbandry to an uncertain situation. As a consequence, investments lagged behind the required level an animal husbandry started to continuously lose ground. The proper ratio of sole proprietorships and partnerships can ensure the balance between plant production and animal.	YES
H.4. Since our EU accession there has been a decreasing rate of employment due to the decline of labour intensive industries. Although investments and more developed technology is typical of partnerships, sole proprietorships have made great advances in this field.	YES

Source: author’s own editing, 2016.

4. NEW AND NOVEL SCIENTIFIC RESULTS

New and novel results

- 1. It has been proved by modern mathematical and statistical methods that the potentials of the country are not utilised. Literature and questionnaires as well as in-depth interviews justify that the appreciation of agriculture and agribusiness is expected in the world, in Europe and in Hungary. The value of land and land lease is rapidly increasing, which can partially contribute to the price increase of agricultural products. Estate concentration is continuous but still far from the effective economies of scale company structure.**
- 2. By synthetizing in-depth interviews I proved that farmers lack cooperation, which can degrade competitiveness. Mainly it is monoculture, over-dominance of plant production and pushing animal husbandry to the background that are to blame for the slow development in our agricultural production. The correction of the bad ownership structure resulting from indemnification is slow and significant amount of capital was extracted from agriculture. The countryside is in a crisis, employment decreased in the 1990's. Based on literature and questionnaire the drawbacks of large-scale land lease are significant. Land lease means capital extraction and sustainability and development are pushed in the background.**
- 3. Based on the results of the Kruskal-Wallis test the profitability rate of partnerships in Baranya county is higher than sole proprietorships. Since the EU accession the sole proprietors' slow gaining of ground and partnerships' losing ground can be seen in addition to growing scale. In 2015 38% of all the land in the country was used by economic organisations, 35% by sole proprietors while 37% could not be used for economic purposes at all. The number of sole proprietorships has dramatically been decreasing while land concentration is on the rise. Local self-supply is getting weaker although the reverse trend would be desirable.**

- 4. Increasing mechanisation and the labour intensive industries' pushing to the background decrease employment rate. Usually partnerships have more capital and use more developed technology so their role in employment is rapidly decreasing. Boosting employment on market basis is hardly feasible. Despite of it, the role of agriculture in employment can be made greater. It is especially increasing irrigation and setting up processing units that can create new jobs. The involvement of existing project funds, emerging cooperative, networking (cluster) systems and integrator that would deal with organisation could mean a breakthrough.**

The production profile of enterprises also influences employment. According to the use of manpower per unit the development of greenhouse horticultural production, vegetable, grape and fruit production as well as animal husbandry can improve the situation. Employment rate could be raised by national organisations and with the inclusion of self-governments.

5. CONCLUSIONS AND RECOMMENDATIONS

My conclusions and recommendations are in line with the research objectives drafted at the beginning. In the Literature Review the theoretical issues and the national situation of land ownership and land utilisation were analysed in details. I also had an insight into the international scenario. Hungary has great endowments for agricultural production and population boom as well as climate change appreciate agriculture all over the world. To make use of our potentials it is not the same how sensible and effective land use system can be created. Sustainability must be reached for future generations and such land use system must be introduced that has a benevolent effect on the soil and its environment. Our soil is continuously degraded.

In our country both sole proprietorships and partnerships can be found. Efficient production takes place on different scales and from certain aspects both large scale and small scale production can be advantageous.

Cooperation would be of great importance, which is the basis for successful management but there is a lot to do in this area. Another problem is that partnerships can farm on leased land. This regulation is not considered fair by many respondents.

The introduction of farm regulations would better serve to stop accumulating significant foreign ownership.

There have not been any serious changes in the cultivation branches of land for long although it would be desirable to increase the proportion of vineyards.

The ratio of agribusiness is in line with that of the developed countries. The concept of agribusiness points out that advances can only be made if the entire value chain develops proportionally and in harmony. The specific output (1.2 thousand euro/ha) is low in the EU, which proves that our potentials are not exploited.

Land prices are continuously and constantly rising. In accordance with it, land lease fee is also rising. Tiny estates are still a problem but estate concentration is continuous.

Extraction of land for other purposes is still going on. We have to aim that the land not cultivated should not be of the best quality and it should be limited to the smallest plot possible.

The National Land Fund plays an important role in creating viable farms and strengthening family farms, as well.

The current land use systems can be classified as follows.

- industry-like production systems;
- integrated plant production systems;
- alternative (ecological) management systems.

Law also caters for farming on natural protected areas.

Based on the farm accountancy network data of AKI profits increased at both sole proprietorships and partnerships. The role of agriculture in employment must be utilised better by changing production structure.

My primary research was based on questionnaires. These examinations make up the central part of the dissertation. Statistical analyses were detailed in the paper so now only my most important conclusions and recommendations are summarised.

The main steps necessary for improving the situation are the following.

- creating company structures with economies of scale;
- cooperation, networking, cluster formation;
- changing production structure, preference of labour intensive industries;
- increasing resources used for production;
- strengthen the positions of the food industry to make use of the multiplier effect;
- decreasing the ratio of leased land;
- introduction of farm regulation;
- well-grounded developments to enhance employment.

6. LIST OF PUBLICATIONS ON THE TOPIC

Publications in journals

In a foreign language:

1. Ugrórsdy Gy. – **Ragoncsa Z.** – Szűcs I. – Balyi Zs. (2013): Situation and future of land-based mortgage lending. *Economics of Sustainable Agriculture*: pp. 47-60.
2. **Ragoncsa Z.** – Ragoncsáné Pap Á. (2012): Efficiency evaluation of rural development programs. *Economics of Sustainable Agriculture*: pp. 93-107. HU ISSN 2062-445X

In Hungarian:

3. Dupcsák Zs. – **Ragoncsa Z.** – Marselek S. (2015): Kedvező változások az agrártermelésben. *Östermelő, gazdálkodók lapja*, XIX. (4) 16-21. pp. HU ISSN 1418-088X
4. Dupcsák Zs. – **Ragoncsa Z.** – Marselek S. (2016): A kukoricatermesztés ökonómiai elemzése. *Östermelő, gazdálkodók lapja*, XX. (1) 27-34. pp. HU ISSN 1418-088X
5. **Ragoncsa Z.** – Szűcs Cs. – Marselek S. (2016): Földtulajdon, földhasznosítás és foglalkoztatás. *Acta Carolus Robertus*, 6. (2) Gyöngyös, 1-11. pp. (megjelenés alatt) ISSN 2062-8269

Scientific conference presentations in proceedings

In Hungarian:

6. **Ragoncsa Z.** – Szűcs I. – Vingoradov S. – Ugrórsdy Gy. (2013): Termőföldek gazdasági értékelésének módszertani továbbfejlesztése. In: Ferencz Á. (szerk.) *Gazdálkodás és menedzsment tudományos konferencia, I. 2013. 09. 05.* Kecskemét, Kecskeméti Főiskola Kertészeti Főiskolai Kar, 3-7. pp. ISBN 978-615-5192-19-7.
7. Szűcs Cs. – **Ragoncsa Z.** – Marselek S. (2016): Földhasznosítás és fenntarthatóság kérdései. In: Takácsné György K. (szerk.) *Innovációs kihívások és lehetőségek 2014-2020 között.* XV. Nemzetközi Tudományos Napok, Gyöngyös, 2016. 03. 30-31. Károly Róbert Főiskola, 1499-1507 pp. ISBN 978-963-9941-92-2

8. Szűcs Cs. – **Ragoncsa Z.** (2016): Földtulajdon, földhasználat és fenntarthatóság. In: Ferencz Á. (szerk.) Gazdálkodás és menedzsment tudományos konferencia II. 2015. 08. 27. Kecskemét, Kecskeméti Főiskola Kertészeti Főiskolai Kar, 33-38. pp. ISBN 978-615-5192-34-0II.

Chapter of books in Hungarian

9. Szűcs I. – Balyi Zs. – **Ragoncsa Z.** – Ugrósd Gy. (2014): A természeti erőforrások együttes értékelésének elvi-módszertani alapja. In: Szűcs I. – Molnár J. – Ugrósd György (szerk.) Rendszerszemlélet érvényesítése a természeti erőforrások egységes értékelésében. 340. p. Szent István Egyetem Kiadó, Gödöllő, pp. 11-34. ISBN 978-963-269-422-1

Chapter of books in a foreign language

10. Szűcs I. – Balyi Zs. – **Ragoncsa Z.** – Ugrósd Gy. (2014): Methodological issues of the evaluation of natural resources. In: Gy. Ugrósd, J. Molnár, I. Szűcs (szerk.) The Evaluation of Natural Resources. 329. p. Agroinform Kiadó és Nyomda Kft., Budapest, pp. 11-34. ISBN 978-963-502-971-6