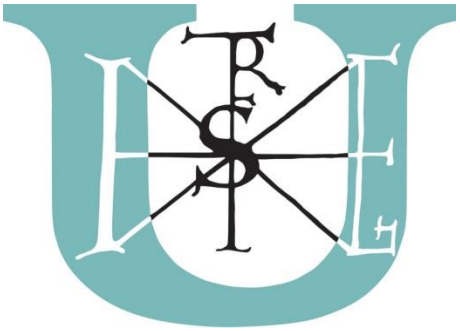

SZENT ISTVÁN UNIVERSITY

THE SPATIAL ECONOMIC ANALYSIS OF STRATEGIC DEVELOPMENT DIRECTIONS IN THE MICRO REGION OF GYÖNGYÖS

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TABLE OF CONTENTS

1. BACKGROUND AND OBJECTIVES

Regional differences are typical in Hungary, as well as in the EU. The lagging behind and the disadvantageous position of rural areas is illustrated by two highly important indicators, emigration and the loss of rural population. The EU intends to reduce the disparities between the regions by implementing harmonious, regionally balanced economic, social, cultural and environmental development. It includes the realignment and the development, i.e. the integrated rural development of rural areas. It is important that the elaboration of the strategic development directions should designate the objectives and the principles of the rural policy of the micro region based on a vision that puts these negative trends, sustainability and the values of rural life in its center. Its most important area is the balanced and diverse production structure which fits to the ecological endowments and is built on the rural economy, increasing employment and small and medium-sized farms. The strengthening of local products and food markets is essential for the improvement of the demographic indicators of the region and the preservation of biological diversity.

The topicality of the subject

The economic and social crisis, as well as the deepening crisis of the agricultural sector and village life, has drawn attention to the necessity of rural development and regional development. These policies aimed to reduce disparities in the development level of regions between the different municipalities of the country. Their most important task is to improve the living conditions of the rural population, and to expand employment and income opportunities from local financial resources complemented by the central government's support. It was WILLIAMSON (1965) who first examined the dependence of the regional fragmentation of development by empirical, statistical-based comparative analysis of the regional disparities within a country.

In the last decade migration from rural areas has become more and more intensive. As livelihood opportunities are lacking, most people have probably left the country for a better living. In this respect, positive changes have occurred only in the regions of Central Hungary, Central and Western Transdanubia, while in the regions of Northern Hungary and the Northern Great Plains the migration balance is more and more unfavourable (MAGDA et al., 2010). The greatest problem in the micro region of Gyöngyös, which I examined, is the low number of job opportunities. The working population commutes every day, as job opportunities are only provided at the nearby larger towns (Eger, Hatvan, Budapest). However, this problem is also typical and challenging in the other regions of the country (KÁPOSZTA et al., 2010). MARSELEK – TAKÁCSNÉ (2011) consider that the increase of employment

can be reached in the agricultural sector in the fastest and most economical way. According to them, the managing, organizing and developing tasks of the state must be restored. It is important to think in systems, and not in small or large enterprises.

The objectives of the research

During my work I have tried to explore and answer the challenges that arise in the micro region of Gyöngyös, and to reveal the causal relationship of the arising problems.
Accordingly, the fundamental **objectives** of my research were:

- to determine the Complex Development Indicators that are related to the socio-economic variables, as well as the variables of agricultural land use of the settlements in the micro region;
- to draw up the relationship of the target system of the development projects implemented so far and future opportunities;
- to develop an adaptable integrated rural economic model, which can be an alternative to the development strategies of Hungarian micro regions.

The hypotheses of the research

I formulated the following hypotheses related to the questions that have arisen about the topic of the research:

Hypothesis (H1): The development of the micro region of Gyöngyös is generally moderate, however, it can be classified among the developing micro regions.

Hypothesis (H2): One of the major economic potentials of the investigated micro region is agricultural land, so my most important assumption was that the large reduction of agricultural production and processing is the most significant problem in the region.

Hypothesis (H3): The number of individual farms and enterprises, and the share of employment in agriculture and in the service sector decrease. The opportunity to get alternative incomes declines as well.

Hypothesis (H4): The role of employment in agriculture and in processing plants has greatly reduced, inadequate integration is also a problem. The large number of people who give up land use, the closure or marginalization of the processing industry (meat, dairy, grain industry, cold stores etc.) affected the sense of discontent and have greatly contributed to the emergence of problems.

Hypothesis (H5): The population of the micro region is continuously declining. The intention to emigrate from the micro region in the hope of a better livelihood, even abroad, is significant. Job opportunities are mainly generated by industrial parks and local governments. The moderate number of job opportunities and low salaries are major sources of dissatisfaction.

2. MATERIAL AND METHOD

2.1. Complex developmental analysis

2.1.1. Complex developmental analysis of economic and social indicators

The complex development index indicates how large the development disparities are between settlements by taking several indicators into account. For the analysis I used the indicators listed in Annex 3 of National Assembly resolution No. 67/2007 (VI. 28.) and National Assembly resolution No. 1/2014. (I.3.), which contain the data that are used when calculating the complex indicator that measures the socio-economic and infrastructural development/underdevelopment of micro regions and municipalities. The Regional Statistics of the Dissemination Database of the Hungarian Central Statistics Office (HCSO) and the database of the National Regional Development and Spatial Planning Information System (RDSPIS) were also of my help to compile municipal indicators.

29 indicators from the group of economic, infrastructural, societal, social and employment indices were taken into account to work out the complex development index.

In order to make the comparison of the 29 variables applied for determining the development of settlements possible a scale coordinate transformation was carried out using the following formula of MOLNÁR (2001):

$$\mathrm{cdi} = \Sigma \frac{x_i - x_{min}}{T_x},$$

where:

cdi = the complex development index of the investigated settlement,

x_i = the value of variable x at the investigated settlement,

x_{min} = the minimum value of variable x at the settlements of the investigated region,

T_x = the range of variable x.

However, for those variables that have a negative impact on the development of settlements, the formula was modified as follows:

$$\mathrm{cdi} = \Sigma \frac{x_{max} - x_i}{T_x}.$$

The revised formula was used for the following indicators: general accessibility indicator, mortality rate, the average number of the recipients of regular social assistance from the local government per 1000 inhabitants per year, the number of recipients of extraordinary child protection support provided by the local government per 1000 inhabitants, the proportion of registered jobseekers in the working-age population, the proportion of permanently registered – for more than 180 days – jobseekers in the working-age population.

The Complex Development Index (CDI) of the settlements in the micro region of Gyöngyös was produced as a simple arithmetic average of these indicators, with the help of which the developmental order of municipalities could be determined. For the annual comparison of municipalities, coefficient of variation calculations were applied to detect the relative standard deviation using the following formula (the percentage ratio of the standard deviation to the mean):

$$CV = \frac{\sigma_{cdi}}{\bar{x}_{cdi}} * 100$$

These indicators were further classified for the GIS analysis. The investigated statistical data of the municipalities in the micro region were attached to the vector map database of the administrative territory of the municipalities by ArcMap 10.1 software. With the help of the software thematic maps of the Graduated colors scheme were created based on the quantitative values, for the preparation of which the number and the range of the classes were determined using the method of equal intervals taking into account the extreme values of the investigated data.

The investigated factors were selected from the 29 variables on the basis of factor loadings. The impact of these factors on the Complex Development Index was examined by regression analysis. The Cobb-Douglas production function was used to describe the relationship as SZŰCS (2002) suggests. The formula of the function is the following:

$$\underline{Y}_i = a x_1^{\alpha} * x_2^{\beta} * x_3^{\chi} \ldots . ,$$

where:
a = constant,
$\underline{Y_i}$ = the Complex Development Index (CDI) in the i^{th} investigated year,
x_1; x_2; x_3;… = the complex development indicators (cdi) involved by the factor loadings,
α; β; γ;… = returns to scale of the factors.

First the indicators were transformed in order to convert the non-linear relationship into a linear one:

$$\ln (\underline{Y}_i) = \ln (a) + \alpha \ln (x_1) + \beta \ln (x_2) + \gamma \ln (x_3)\ldots$$

Next, the logarithm of the variables was calculated, and then the fitting of the multivariate linear regression equation was completed. During the calculation of the function I assumed that the function is homogeneous, the evolution of the dependent variable is 100% determined by the independent variables. Using the formula the effect of the single variables on the CDI could be determined.

$$1 = \frac{\ln a}{\ln \underline{Y}i} + \frac{\alpha \ln(x_1)}{\ln \underline{Y}i} + \frac{\beta \ln(x_2)}{\ln \underline{Y}i} + \frac{\gamma \ln(x_3)}{\ln \underline{Y}i} \ldots$$

2.1.2. Complex developmental analysis of agricultural land use

During my research I analyzed how the micro region of Gyöngyös changed in the decade of 2000-2010, and how land use patterns were transformed in the same period with the help of mathematical and statistical methods. In addition I tried to find how the complex development of the micro region and land use characteristics are correlated. I wanted to know whether the measurement of complex development is suitable to detect the differences in land use between the municipalities, and finally how much local land use, as a means of the utilization of natural resources, influences the job opportunities and the quality of life of the dwellers of the municipality. The experience of the measurement at the municipal level raises the problem of the availability of data. In order to formulate the complex development index the 21 variables related to land use available from the settlement database of the HCSO were taken into account. The method used for calculating the complex development index was applied for this analysis as well, for the different municipalities and for the micro region of Gyöngyös, in the same way as it was described above. The values of the indicators, which were between 0 and 1, were transformed to a value between 1 and 10.

2.2. Questionnaire survey

In addition to the physical factors that express municipal comfort, basic operating conditions and development, the mental well-being of the dwellers is also an important aspect. The results of the quantitative method can be quantified, and the data obtained can be analyzed using different statistical methods (LEHOTA, 2001).

Compiling the questionnaire I tried to formulate questions the answers for which can help getting aware of the residents' opinions, the degree of their satisfaction and their attitude to everyday problems. One of the basic requirements of the increase of satisfaction and quality of life is the strong, competitive local economy, which should be based on the utilization of local natural and environmental values at a significant degree.
The survey was conducted between July and December 2013 at the 25 settlements of the micro region of Gyöngyös. The target respondents of the investigation were the residents of the 25 municipalities of the micro region who were over 18 years old. The survey was preceded by test interviews, as a result of which, the final questionnaire was put together. The number of evaluable questionnaires was 1,682.

2.2.1. The structure of the questionnaire

I used a questionnaire containing 25 questions (18 of them were related to the subject matter and 7 were demographic ones). The questions covered the basic data of the population, and their opinions related to the local society, economy, and environment. The questionnaire I applied contained both open and closed questions. In case of closed questions the opportunity to respond is limited, while open-ended questions allow free response, the respondents formulate their responses themselves (SZŰCS 2008).

2.2.2. Crosstab analysis

Crosstab analysis describes two or more variables simultaneously, indicating their combined frequency distribution. The most common crosstab-based statistical method of hypothesis testing is Pearson's Chi-square, which measures the statistical significance of the relationship between two variables (SAJTOS – MITEV 2007). If the significance level of the chi-square values is less than 0.05, the null hypothesis can be rejected, otherwise it must be accepted.
With the help of this method I tried to find out which factors influence the intention to emigrate from the municipalities of the micro region the most.

2.2.3. Kruskal – Wallis test

The aim of the procedure is the comparison of the means of three or more independent samples. The test is essentially the generalization and extension of the Mann – Whitney test. It is the non-parametric counterpart of the single point ANOVA. It can substitute ANOVA, if the standard deviations of the groups are very different, the shape of the distributions differs, or if the normality condition of the groups is strongly violated. It is also referred to as rank transformation

procedure, as the rank numbers must be determined after the combination of the samples. During the test the independent samples are combined, resulting in a combined, joint sample, which is arranged in order (FIDY - MAKARA 2005). I examined the differences of opinions in the following groups of questions with the Kruskal – Wallis test: the respondents' satisfaction and problems with the micro region and with their place of residence, and the importance of investments. At the group of questions about the importance of investments, the Kruskal – Wallis test was complemented by Kendall's test of concordance.

2.2.4. Exploratory factor analysis

According to SAJTOS – MITEV (2007) two types of exploratory factor analysis can be distinguished. One of them is the principal component analysis, and the other is common factor analysis. If we know the variables well, and the goal is to achieve the highest explained variance using a minimum number of factors, it is advisable to use the principal component analysis. Factor analysis can be used when the variables are not known, and no information is available on the extent of the individual and error variance. Our goal is the exploration of hidden dimensions. The underlying idea behind the principal component analysis is that the full matrix can be represented relatively well with a small number of background variables, "underlying factors". The Bartlett test and the Kaiser test can be used for determining its applicability. The analysis is only meaningful if the significance is less than 0.05 on the basis of the Bartlett test, which means that there is a correlation between the variables. The method was used to explore residential problems during the evaluation of question group 11.

2.2.5. In-depth interview

Qualitative information allows a deeper understanding of the relationships of the topic. The respondents can formalize their thoughts and feelings into words using their own terms. The reason for choosing this method is that the individual in-depth interview is a personal, direct conversation, which has several advantages (e.g. the respondent feels less embarrassed than during a group interview) (SHEATSLEY 1963).

3. RESULTS

3.1. The results of the complex developmental analysis of economic and social indicators

The description of the main statistical characteristics of the indicators is an important aspect during the complex developmental analysis of the micro region. It can be concluded from the evolution of the relative standard deviation that in case of more than half of the indicators, which are typically infrastructure-related variables, regional rapprochement is seen, but in case of the other indicators differentiation can be observed.

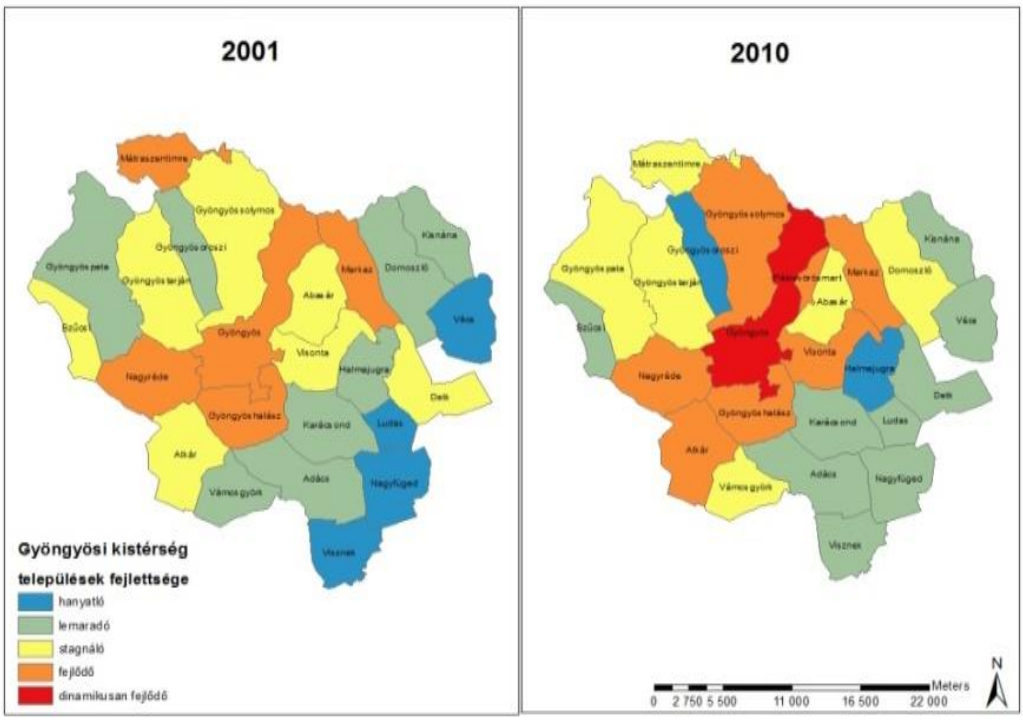

Figure 1: The development level of the municipalities in the micro region of Gyöngyös based on the complex development index in the years 2001 and 2010

Source: own composition, 2013.

Based on the complex development indicator it can be stated that Gyöngyös was the most developed municipality in the micro region both in the year 2001 and 2010. The first investigated year's score of 0.5900 increased to 0.7107 by the second investigated year. At the beginning of the investigation Markaz (0.5490), Mátraszentimre (0.5390) and Nagyréde (0.5290) belonged to the most developed municipalities of the micro region. It changed by the year 2010, as six

municipalities preceded Markaz, and Mátraszentimre also fell back seven places. In contrast, development could be observed in case of Gyöngyöshalász and Atkár, and Pálosvörösmart, after getting separated from Abasár, was also positioned in the forefront.

The GIS display classifies the municipalities into five groups[1]. In 2001 – as it is shown in Figure 1 – none of the settlements was classified into the category of dynamically emerging municipality on the basis of the investigated complex indicators. In the same period Gyöngyös, and its neighboring municipalities of Nagyréde, Gyöngyöshalász and Markaz, and the northernmost settlement of the micro region, Mátraszentimre were developing ones, moreover, the latter got the maximum score in case of 5 variables. At the south-eastern periphery of the micro region there were 4 declining municipalities, all of which got in the lagging group in the 2010 investigation. Due to the development projects implemented, at 17 municipalities and at the newly separated Pálosvörösmart some progress was achieved, however only the town of Gyöngyös managed to get into the best group. Stagnation could be observed in Abasár and Markaz, while Detk, Halmajugra, Gyöngyösoroszi, Mátraszentimre and Szűcsi were declining by the end of the investigated decade. The overall conclusion is that the micro region moderately developed over 10 years.

Based on the function results, Table 1 contains the impact of the investigated factors on CDI. It can be concluded from the table that the motorway accessibility indicator (17.88%), the share of employment in the service sector (17.83%) and the number of active enterprises per 1,000 inhabitants (17.33%) had the most significant impact on the investigated Complex Development Index (CDI) in the year 2001.

Table 1: The role of the different factors in the development of the index CDI, percent

Indicator	Year 2001 (%)	Year 2010 (%)
x_1 the number of active enterprises per 1,000 inhabitants	17.33	19.08
x_4 the share of employment in agriculture	15.97	19.24
x_5 the share of employment in the service sector	17.83	19.34
x_7 the local governments' revenue from local taxes	-	10.62
x_{16} the motorway accessibility indicator	17.88	15.86
x_{19} net migration	14.63	-
x_{21} personal income tax base per resident	16.36	15.86
Total	100	100

Source: own calculation, 2013.

[1] The ranges of the classes were determined with the help of the software ArcMap 10.1, taking into account the extreme values of the investigated data when displaying the thematic map of the Graduated colors scheme based on the average values, using the method of equal intervals: declining: 0,241379 - 0,335241; lagging 0,335242 - 0,429104; stagnating: 0,429105 - 0,522967; developing: 0,522968 - 0,616830; dynamically developing: 0,616831 - 0,710693

In 2010 the share of employment in the agricultural and service sectors and the number of active enterprises still significantly affected the CDI. The role of the motorway accessibility indicator and personal income tax base somewhat reduced. The newly involved indicator, the local governments' revenue from local taxes had the least significant effect on the development of the CDI.

3.2. Complex developmental analysis of agricultural land use

The number of land users reduced from 10,305 in 2000 to 4,879 in 2010, which led to significant problems in employment.
The lowest proportion of permanently registered jobseekers in the working-age population was in Detk in 2000 and in Pálosvörösmart in 2010, while the highest proportion was in Nagyfüged, and in Halmajugra in the same years.
The number of private farms per 1000 inhabitants is located in the middle of the measuring range with a value of 5. The number of private farms in 2010 was 46.65% of that number in the year 2000. It was in Matraszentimre where the most significant decrease occurred in the number of private farms, in the number of private farms per 1000 inhabitants, as well as in the complex development index. The value of the cdi changed from 3.38 to 1.06. The number of private farms per 1000 inhabitants decreased the least in Gyöngyöstarján, Gyöngyösoroszi and Markaz. The decrease was below average in Abasár, Atkár, Gyöngyöshalász, Gyöngyöspata, Gyöngyössolymos, Szűcsi and Visznek. The value of this indicator was above the micro regional average at the other settlements.
The 52.6% reduction in the number of individual farmers between 2000 and 2010 resulted in the 8.8% decrease of land used by individual farmers, but at the same time the average territory of individual farms increased from 2.2 ha to 4.3 ha. The average size of individual farms justifies that the production of labor intensive crops is decisive in the micro region. However, the average territory of arable land per 1000 inhabitants also increased from 0.82 ha to 2.55 ha in the micro region. It is a significant increase, the concentration of land is recognizable.
It can be concluded that average land size and its growth rate is significant only at those municipalities where the proportion of arable land and grassland is decisive.
The number of agricultural organizations per 1,000 inhabitants does not show nearly as good value as the number of active enterprises. The land users of business organizations have increased compared to the data of the year 2000.
The average territory of vineyards increased from1.61 ha to 6.55 ha, that of forests from 13.6 ha to 20.7 ha over 10 years. The lack of the integration of berry processing and selling has led to the situation where a settlement like Nagyréde, which had a long history of fruit growing, raspberry growing has

almost ceased to exist. In case of grape acquisition, grape processing and oenology the lack of full integration and the premium for grubbing up vineyards reduced the area under vines in the micro region.

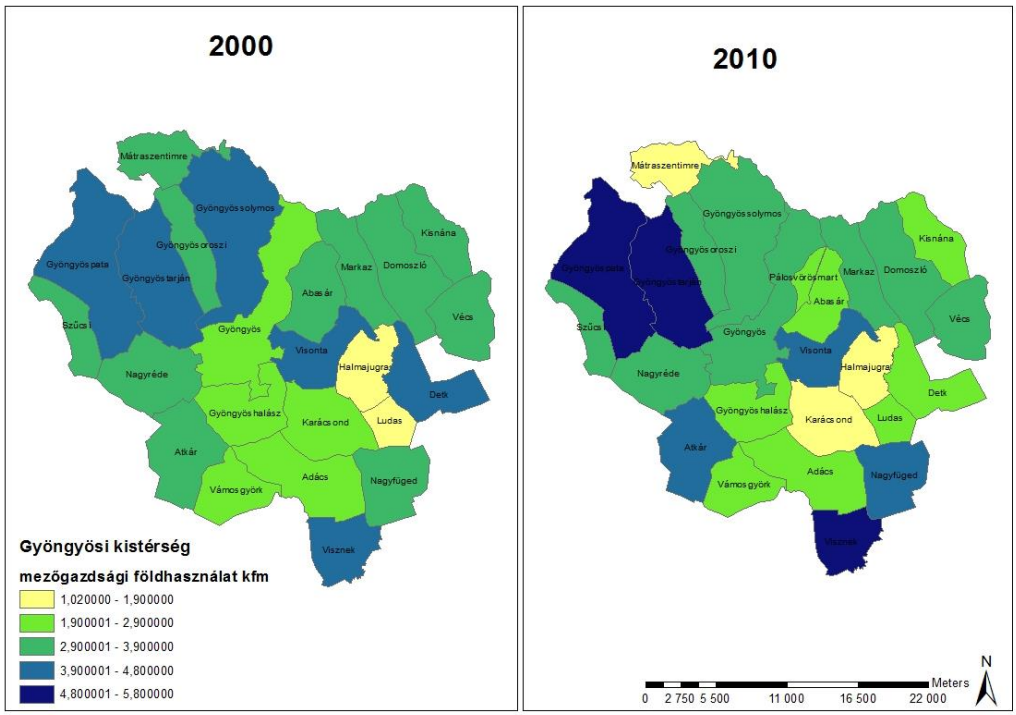

Figure 2: The development of the indicators related to agricultural land use in the complex development index at the municipalities of the micro region (2000, 2010)

Source: own composition, 2014.

I distinguished five groups[2] of the municipalities of the micro region, which are shown in Figure 2. In 2000 two settlements (Halmajugra and Ludas) belonged to the lowest value group, which is called declining municipality, and by 2010, in addition to Halmajugra, Karácsond and Mátraszentimre got into this group based on 21 variables. In 2000, there were 5 lagging, 11 stagnating and 6 developing settlements. By 2010 the decline of Visonta, Detk and Mátraszentimre, and the development of Atkár can be observed, while Visznek, Gyöngyöspata and Gyöngyöstarján managed to get into the dynamically developing group.

[2] For the preparation of thematic maps, the range of the classes was determined using the method of equal intervals taking into account the extreme values of the investigated data: declining: 1,020000 – 1,900000; lagging:1,900001 – 2,900000; stagnating: 2,900001 – 3,900000; developing: 3,900001 – 4,800000; dynamically developing: 4,800001 – 5,800000

The highest value can be observed in the municipality of Visznek both in the years 2000 and 2010, which is due to the fact that the highest cultivation area per 1,000 inhabitants, and the highest average size of land was found here both in 2000 and 2010. 4 indicators show the maximum value, while another four show the second highest value. It is in Gyöngyöspata where the territory of vineyards used by private farms per 1000 inhabitants has the highest coefficient. The role of the private farms and business organizations is decisive at the municipality of Gyöngyöstarján. In case of private farms orchards occupy the highest proportion of land, however, by the year 2010 the coefficient of forest areas has risen to 9.76. At the municipality of Detk the value of the following indicators was maximal in the year 2000: the total area of land, the average size of land, and the area of arable land used by business organizations that pursue agricultural activities per 1000 inhabitants.

Based on the function results the impact of the investigated factors on the Complex Development Index can be seen in Table 2. In 2010, the number of long-term registered jobseekers (35.56%) had the greatest effect on the complex development index. It was followed by on-farm employment and the size of individual farmers' vineyards per 1000 inhabitants, which has the least significant impact on the complex development index. The other investigated factors did not have much impact on the indicator either in 2000 or in 2010.

Table 2: The role of the different factors in the development of the CDI, percent

Indicator	Year 2000 (%)	Year 2010 (%)
x_4 The proportion of permanently registered jobseekers in the working-age population	18.88	35.56
x_5 The number of private farms per 1000 inhabitants	19.22	16.56
x_6 The area of land used by private farms per 1000 inhabitants	14.14	-
x_{11} The average area of land used by private farms	12.22	-
x_7 The territory of vineyards used by private farms per 1000 inhabitants	-	12.09
x_2 The number of active enterprises per 1,000 inhabitants	14.95	16.61
x_{21} The number of employees at farms compared to the number of active workers	20.59	19.18
Total	100	100

Source: own calculation, 2014.

During the formulation of sectorial, strategic and structural development programmes it is of primary importance to take natural endowments into account. In the investigated micro region the majority of the population is affected by the changes in agriculture, as at many municipalities this activity is the residents' main source of income. Therefore it is important to implement measures related to the increase of competitiveness in accordance with measures related to rural development. The widening of integration is also necessary.

3.3. The results of the questionnaire survey

The evaluation of the questionnaire survey is an important part of my dissertation, as it is the place where I can evaluate the experience of the respondents of the questionnaire. On the basis of the evaluation I can perform an analysis, arrive at conclusions and formulate recommendations.
The questionnaire was edited in accordance with the purpose of the survey with the involvement of the residents of the micro region. I assessed the opinions of the resident population of the micro region of Gyöngyös about municipal comfort with the intention of enabling municipal leaders to utilize the responses and assessments.

3.3.1. The short introduction of the participants of the questionnaire survey

The 1,682 respondents were classified into three age groups, 18-30 year olds, 31-50 year olds and over 51 years of age. 23% of the respondents are between 18 and 30 years old, however, aging population is also obvious here, since the proportion of people over 51 years old is 29.4%. The largest group is that of 31-50 year olds, their proportion is 47.6%.
A significant part of respondents (41.9%) live at the municipality since their births, which means that their answers regarding the perception of the comfort of the municipality is relevant, their opinions must be taken seriously. About half of the respondents (51%) stay at the municipality because of family ties, and a quarter of them because of their jobs.
Income conditions in the micro region of Gyöngyös are significantly worse than in the more developed areas of the country, despite the fact that Budapest is accessible within one hour on the motorway. Local salaries are considerably below the ones in Budapest, not to mention German or Austrian salaries. The responses are spread by income situation, respondents who have daily living problems see the situation differently from those who have a good income. I set up five income categories, their distribution is presented in Table 3.

Table 3: The distribution of respondents by net monthly income, %

Categories	The distribution of net monthly income, %
Under 50,000 HUF	18.2
50,001 – 100,000 HUF	38.5
100,001 – 150,000 HUF	27.2
150,001 – 200,000 HUF	10.0
Over 200,001 HUF	6.1

Source: own research, n=1680, 2013.

Table 3 indicates that the income of 83.9% of the respondents was less than a monthly net income of 150,000 HUF, and the proportion of those who have a net income over 200,001 HUF is only 6.1%.
The proportion of women was higher, 62.9% of the respondents were women, while 37.1% were men.
I also classified the respondents according to their highest level of education. I set up three categories of respondents, ones with primary, secondary and tertiary education. People with secondary education make up the largest group (54.9%), the proportion of people with primary education is 11.0%, while the proportion of people with a college or a university degree is surprisingly high, 34.1%.
Examining the marital status of the respondents it can be said that more than half of them were married (55%), 26% of them were single, 13% were divorced, and only 6% were widows or widowers.

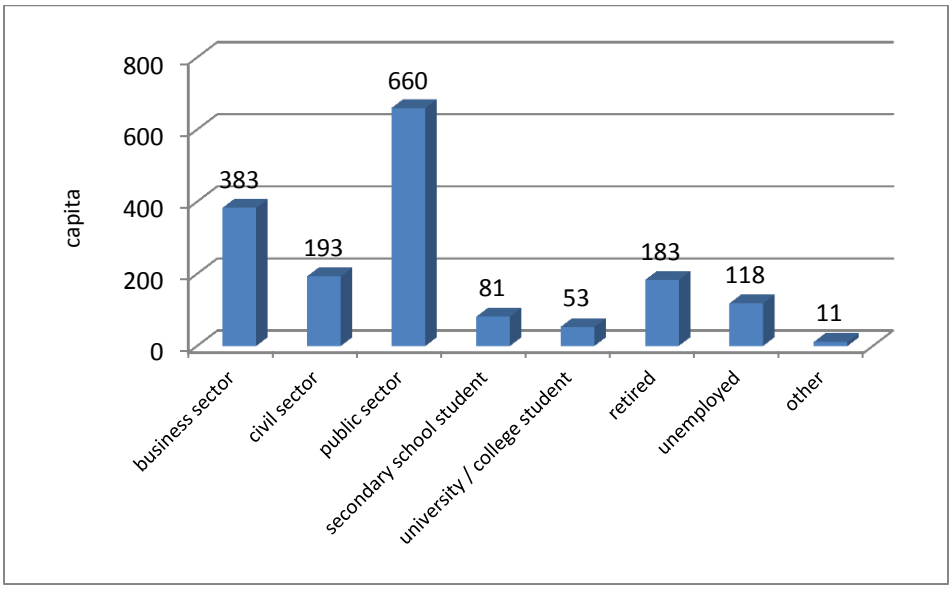

Figure 3: The sectorial classification of the workplaces of respondents (capita)
Source: own research, n=1264, 2013

In terms of sectorial classification the largest group of respondents is formed by the people who work in the public sector. The business sphere is represented by 383 people, while the NGO sector is represented by only 193 people. At the time of the survey, 118 respondents were unemployed, and 183 people were retired.

3.3.2. The intention to move away

I analyzed which factors affect the intention to move away with the crosstab method, the result of which showed that there is a correlation in two cases – in case of net monthly income and age.
People with a monthly net income below 50,000 HUF were planning to leave their settlements in the highest proportion (36.5%), however, they represent only 18.1% of the whole sample. The intention of people belonging to the lowest income group to emigrate can be explained with the mood resulting from their current life situation, as the unemployed respondents belong to this group. However, they are probably less mobile it is definitely their financial situation that prevents them from moving away, and their real estate is relatively stable savings for them.

Table 4: The relationship between respondents' net monthly income and the intention to move away

		Do you intend to move away?		Total
		no	yes	
- 50,000 HUF	Number of cases	193	111	304
	The net monthly income of the respondent	63.5%	36.5%	100,0%
	Do you intend to move away?	14.3%	33.8%	18,1%
50,001 - 100,000 HUF	Number of cases	554	94	648
	The net monthly income of the respondent	85.5%	14.5%	100,0%
	Do you intend to move away?	40.9%	28.7%	38,5%
100,001 - 150,000 HUF	Number of cases	383	75	458
	The net monthly income of the respondent	83.6%	16.4%	100,0%
	Do you intend to move away?	28.3%	22.9%	27,2%
150,001 - 200,000 HUF	Number of cases	140	28	168
	The net monthly income of the respondent	83.3%	16.7%	100,0%
	Do you intend to move away?	10.3%	8.5%	10,0%
200,001 HUF -	Number of cases	84	20	104
	The net monthly income of the respondent	80.8%	19.2%	100,0%
	Do you intend to move away?	6.2%	6.1%	6,2%
Total	Number of cases	1354	328	1682
	The net monthly income of the respondent	80,5%	19.5%	100.0%
	Do you intend to move away?	100,0%	100.0%	100.0%

Source: own calculation, 2013.

Moving towards the higher income categories, the rate of people who intend to move away decreases, however, respondents who belong to the highest income category also answered yes to the question in a higher percentage (19.2%). In their case, actual emigration is much more likely, they are probably less affected by the factors that inhibit mobility, they can overcome obstacles more easily. However, considering the total sample, respondents do not seek to move away, the majority of them (80.5%) answered no to the question that inquired about their intension to move away. It is a positive fact considering the future

demographic situation of the micro region, as the less mobile a region is, the longer communities can survive (Table 4).

Table 5: The examination of the relationship between income and the intention to move away

	Value	Degree of Freedom (df)	Two-sided significance level
Pearson's Chi-square	70.060[a]	4	.000
Likelihood ratio	62.547	4	.000
Linear correlation index	18.694	1	.000
Number of valid cases	1682		

a. The expected value of 0 cells (0.0%) is less than 5. The minimum expected value is 20.28.

Source: own calculation, 2013.

According to the table of significance (Table 5) the chi-square value is 70.060 and the value of the significance level is 0.000, which means that the null hypothesis can be rejected with 95% certainty – at the corresponding 5% error level. There is a statistically proven relationship between the two random variables.

3.3.3. Principal component analysis

I examined the responses for the 26 variables of question group 11 by principal component analysis. The three principal components retain 54.212 percent of the information provided by the 26 original, measured variables. Table 6 shows that the principal component that includes the first greatest common variance is related to agriculture.

In the interpretation of the principal component the lack of integrated management, the lack of processing plants, inadequate farm structure, the decline of the construction industry related to agriculture and the decline in agricultural production were significant factors. They were followed by the decline of tourism, local economy, local natural resources, local infrastructure and the lack of cooperation. Welfare services, such as the variables of nursery care, basic local services, local communal services, the supply of homes, local education, official administration, local health care, local culture and the local environment belonged to the second principal component. The third principal component can be associated with the mobility of the workforce. The variance explained by this principal component is 12.4% of the total variance. Low professional qualifications, high unemployment, the demographic situation, emigration and public safety belong to this principal component. The principal

components indicate the consistency of opinions as well. The consistency of opinions is reflected well in case of the presented variables.

Table 6: Principal component analysis rotated component matrix based on the responses for question group 11

	Component		
	1	2	3
- the lack of integrated management	.802		
- the lack of processing plants	.794		
- the decline of the construction industry	.761		
- inadequate farm structure	.731		
- the decline in agricultural production	.688		
- the decline of tourism	.646		
- local economy	.612		
- local natural resources	.571		
- local infrastructure	.542		
- the lack of cooperation	.528		
- nursery care		.786	
- basic local services		.766	
- local communal services		.763	
- the supply of homes		.725	
- local education		.706	
- official administration		.668	
- local health care		.643	
- local culture		.637	
- the local environment		.615	
- day nursery care			
- low professional qualifications			.728
- high unemployment			.721
- the demographic situation			.712
- emigration			.706
- public safety			.583
- average income			.577

Source: own research, 2014.

3.3.4. Investigation into the importance of investments

Question group 12 deals with the importance of investments listing twenty possible areas of investment. There was a significant difference in four cases at the 5% error rate at the analysis based on the monthly net income of respondents (Table 7).

Table 7: Investigation into the importance of investments based on the monthly net income of respondents

Test statistics[a,b]

Denomination	The importance of investments: internal road construction, reconstruction	the development of the road network	the construction of the ring road built around Gyöngyös	the renovation of the drainage system	the maintenance and expansion of the bicycle road network	the renovation and development of playgrounds	hospital investments	the installation of roundabouts at road junctions	the installation and expansion of the number of installed traffic lights	the development of the public transport system	the renovation of homes	the development of plots with public utilities	the establishment of community homes	the creation of cultural, sports and entertainment facilities	investments into tourism	the development of the basic services	IT development	selective waste collection	the construction of the sewage network	the development of the municipality's website
Chi-square	4.04	3.20	6.37	6.84	3.98	5.68	7.77	9.77	14.81	5.37	11.93	8.98	9.77	9.09	1.91	1.87	4.27	3.98	6.86	2.57
(df)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Approx. Sig.	.400	.525	.173	.145	.408	.224	.100	.044	.005	.251	.018	.062	.044	.059	.751	.758	.370	.408	.143	.632

a. Kruskal Wallis Test b. Grouping variable: The monthly net income of the respondent

Source: own research, 2014.

The difference was significant in case of the questions about the installation of roundabouts, the installation of traffic lights, the renovation of homes and the establishment of community homes. People who have lower income (less than 50,000 HUF) and medium income (between 100,001 and 150,000 HUF) consider the installation of roundabouts at road junctions and the expansion of the number of installed traffic lights important. The renovation of homes and the establishment of community homes are important for people belonging to the lower income group.

The ranking of investments can be assessed on the basis of ordered sequence. I examined the responses for the 20 questions based on the three income groups. The consistency of rankings is significant at the 1% error level (Table 8).

Table 8: The priority order of investments according to net income

The ranking of investments	Rank average
internal road construction, reconstruction	19.60
the development of the road network	19.40
hospital investments	17.80
the renovation of the drainage system	16.40
selective waste collection	16.40
the creation of cultural, sports and entertainment facilities	14.00
investments into tourism	12.80
the construction of the sewage network	12.80
the construction of the ring road built around Gyöngyös	11.20
the development of the basic services	10.60
the maintenance and expansion of the bicycle road network	10.20
the renovation and development of playgrounds	9.80
the development of the public transport system	8.60
the establishment of community homes	8.60
the renovation of homes	5.40
IT development	5.20
the installation of roundabouts at road junctions	4.40
the development of the municipality's website	3.20
the development of plots with public utilities	2.40
the installation and expansion of the number of installed traffic lights	1.20

Source: own research, 2014.

3.4. The presentation of the traditional integration model

Agriculture is of outstanding economic and social importance both in the European Union and in Hungary. In our country, a large proportion of the population is affected by the change in agriculture, as for many people this activity is the main form of livelihood. However, for market-oriented farmers it is essential to cooperate with others in order remain competitive. Today, in the era of the emphatic presence of multinational global companies, it is in the interest of producers to produce within a certain connection system in order to ensure market access for their good quality products. The organizer of this mutual benefit cooperation is the integrator. It is his task to maintain trust and confidence with the integrated producers as well.
The method of in-depth interviews was used to understand the integration model in Nagyréde. The method was chosen to obtain more and deeper information from people who have worked in the model from the beginning, experiencing successes and failures as well.

The benefits of the operation of the specialist group are the following:

- it is a useful way of spending free time;

- it provides additional income for the local residents and for the members of the surrounding communities;
- production experience can be transferred to young people, new technologies are learnt;
- the operation of the services – e.g. the survival of the irrigation system – is ensured.

Only environmental load was mentioned as a disadvantage.

I was also wondering what people think of the advantages and disadvantages of the current situation. The reduction of environmental load (pesticides, fertilizers) was mentioned as an advantage, and its disadvantages are the lack of income, the decline of the peasant system of agriculture and the consequent problems of livelihood. These factors result in the increase of emigration.
My in-depth interviewee said as a proposal that it would be important to reorganize the integration, however, a highly capitalized company is essential for this. This company could provide customized employment, or try to achieve maximum mechanization or apply the combination of these two factors.

It can be stated as a proposal that it is essential to develop a system of integration in which fluctuations in the market price can be eliminated by increasing interdependence and a long-term relationship of producers and processors can be formed in a normal live and let live system. The price of 1 kg of grapes was about 30 HUF in 2009, which increased to over 100 HUF by 2012. On one hand the grape price of 30 HUF makes vine producers go bankrupt, while on the other hand wineries can hardly validate the price above 100 HUF on the markets.

3.5. The results of the hypothesis tests

Summarizing the verification or the rejection of the hypotheses that were formulated in the introductory chapter, the following conclusions can be drawn from the test results:

Hypothesis (H1): *The development of the micro region of Gyöngyös is generally moderate, however, it can be classified among the developing micro regions.* Based on the Complex Development Index the development of the micro region is proven, the hypothesis is true.

Hypothesis (H2): *One of the major economic potentials of the investigated micro region is agricultural land, so my most important assumption was that the large reduction of agricultural production and processing is the most significant problem in the region.* Based on the Complex Development Index and the

principal component analysis of the results of the questionnaire survey, the hypothesis is true.

Hypothesis (H3): *The number of individual farms and enterprises, and the share of employment in agriculture and in the service sector decrease. The opportunity to get alternative incomes declines as well.* The hypothesis is confirmed by the complex developmental analysis of agricultural land use, as well as the termination of specialist groups. The decline of the opportunity to get alternative incomes was proven by the data of the in-depth interview in Nagyréde. The termination of one single specialist group at a municipality resulted in the eradication of the alternative income of more than 1300 people. Inadequate integration, which is justified by the analysis of the complex development index, resulted in the termination of further family farms in the grape and wine industry.

Hypothesis (H4): *The role of employment in agriculture and in processing plants has greatly reduced, inadequate integration is also a problem. The large number of people who give up land use, the closure or marginalization of the processing industry (meat, dairy, grain industry, cold stores etc.) affected the sense of discontent and have greatly contributed to the emergence of problems.* The hypothesis is confirmed by the complex developmental analysis of agricultural land use, as well as the principal component analysis of question group 11 of the questionnaire survey.

Hypothesis (H5): *The population of the micro region is continuously declining. The intention to emigrate from the micro region in the hope of a better livelihood, even abroad, is significant. Job opportunities are mainly generated by industrial parks and local governments. The moderate number of job opportunities and low salaries are major sources of dissatisfaction.* The assumption that the population is constantly decreasing was proven, as over 10 years the population of the micro region significantly reduced (the reduction in the permanent population of the micro region is 4,322 people). It is proven by the natural population increase and the migration balance as well. The significance of the intention to emigrate from the micro region is partly not true, and partly proven. Natural population decline was proved by the CDI analysis, emigration is responsible for only 2% of the total decline. However, the questionnaire survey indicates nearly 10 times of this value, which justifies the intention to move away. It is true that the job opportunities are mainly generated by industrial parks and local governments. It is justified by the economic analysis of the micro region.

3.6. New and novel scientific results

Result (R1): The investigated micro region is a moderately developing micro region in the most backward region of Hungary based on the Complex Development Indicators (CDI) of the municipalities. I have determined how certain variables affect the development of the CDI. Based on the values of the CDI I set up the developmental order of the municipalities and classified them into five classes.

Result (R2): The analysis of the Complex Development Index is suitable to detect differences between the municipalities regarding agricultural land use. Based on the complex indicators related to agricultural land use the municipalities of the micro region were classified into the following groups: declining, lagging, stagnating, developing and dynamically developing municipalities. The general crisis of agriculture and the food industry worsened the employment situation of residents, and due to the fragmented structure the proportion of people who earn their living from land cultivation dropped significantly, which increased unemployment in the investigated ten years.

Result (R3): During the examination of residential problems I determined the principal components. The principal component that includes the first greatest common variance is related to agriculture. Welfare services belong to the second principal component, while the third principal component includes variables which can be associated with the mobility of the workforce.

Result (R4): According to the questionnaire survey the importance of investments is similarly rated by respondents with different net income and educational background. The priority order of investments can be determined, the most important areas are road constructions, hospital investments, waste collection, cultural, sports and entertainment facilities and investments into tourism. Prioritization allows decision makers to take bottom-up initiatives into account.

4. CONCLUSIONS AND RECOMMENDATIONS

A basic condition of the success of strategic development programmes is the strengthening of social cohesion, the close cooperation of the community, non-governmental organizations, business organizations and institutions. This can only happen if the stakeholders of the micro region recognize the importance of cooperation and actively participate in the elaboration of strategic development programmes.

The permanent population of the micro region of Gyöngyös declines, which is mainly due to natural population decline. Another major problem in the investigated area is the aging process, which is an obstacle to the regeneration and maintenance of the local society. The age structure of the population has a great impact on demographic phenomena, economic activity, unemployment, etc, that is it shapes spatial processes. The settlement studies show that there are certain municipalities where growth is experienced (474 people at 7 municipalities). The economically active population in the micro region increased from 31,916 to 32,757 people.

During the investigated period (in the years 2001 and 2010) the migration balance was positive only at the municipalities of Abasár, Atkár, Gyöngyöshalász and Visonta. The unemployment rate expressed in terms of percentage of the economically active population increased as well. I consider these negative trends and the elimination of the consequent negative processes important in order to improve the quality of life.

Based on the 29 variables of the CDI I set up the developmental order of the 24, later 25 municipalities of the micro region. The indicators which have the greatest impact on the CDI were also determined. The complex development indicators of several municipalities of the micro region significantly increased by the year 2010, which led to the consequence that the micro region is a moderately developing one. By 2010, due to the development projects implemented, at 18 municipalities some progress was achieved, however, only the town of Gyöngyös managed to get into the best group. Stagnation can be observed in Abasár and Markaz. The complex development indicators of five municipalities indicate some decline. Two of these municipalities, namely Gyöngyösoroszi and Halmajugra, require more attention.

The micro region has two centres of employment. Gyöngyös is the unquestionable service centre of the region, in addition it has a number of major industrial enterprises. The Mátra Power Plant and the industrial park established in its neighborhood is also attracting for the regional labour force.

The number of guest nights per 1,000 inhabitants was primarily concentrated at Mátraszentimre and at the town of Gyöngyös and its resort areas in 2001. By 2010, rural tourism also developed, presumably because of the rural development programmes.

Based on the relative standard deviation it can be stated that the complex development indicators of the municipalities are highly changeable. By 2010 due to the development projects implemented the value of the relative standard deviation significantly decreased, which confirms the more homogeneous development of municipalities.

I formulated a system that describes the complex development related to land use based on 21 variables. The municipalities of the micro region can be classified into five groups. The complex development indicators made the processes related to the land use of the municipalities in the micro region comparable in the period between 2001 and 2010. A wider range of support for investments into production is advisable, especially in the agricultural sector.

The result of the calculation of the coefficient of variation proves that there is a close relationship between the number of long-term jobseekers and agricultural land use. The number of farm workers is the most favourable in Nagyréde and Gyöngyöstarján.

By 2010 the value of the Complex Development Index drastically decreased at two municipalities, which requires the reconsideration of agricultural policy. It is also proven by the order of the municipalities.

The analysis of the intention to move away with the crosstab method is highlighted from the results of the survey. I determined which factors affect the intention to move away the most. As a result, it can be said that relationship was found between the monthly net income, age and the intention to move away. People with a monthly net income below 50,000 HUF were planning to leave their settlements in the highest proportion (36.5%), however, they represent only 18.1% of the whole sample. The distribution of the total sample suggests that 328 people of the 1,682 respondents were planning to move away from the municipality. Young people are of the highest proportion of them, who were followed by the middle age group. Most of them wish to move abroad, to various municipalities in the county, to Western Transdanubia or to Budapest in the hope of a better livelihood and more favourable job opportunities.

The responses for the questions about the satisfaction with the micro region and the municipality, the problems and the potential for development were examined by the Kruskal-Wallis test based on the age, the educational level and the income conditions of respondents. The residential problems were examined with principal component analysis as well.

At the examination of micro regional satisfaction people over 51 years of age considered easy accessibility to be important, while 31-50 year olds, that is the active group considered popularity for tourists to be beneficial. The development level of the communal infrastructure is relevant for the oldest age group, at this age convenience becomes an important aspect. Young people considered the healthy, orderly, clean environment important.

Significant differences in the opinions of the five income groups can be observed. Respondents who have a net monthly income of over 200,000 HUF, who have greater mobility needs, considered the popularity for tourists significantly more important. Not surprisingly, people belonging to the lowest income group, who are in a completely impossible situation did not consider this option important. People who have a lower net income considered the healthy, orderly, clean environment significantly more important.

Every age group, although their considerations are different, agrees that the healthy, orderly, clean environment of the municipality and the micro region is important, therefore people living in the micro region are suggested to pay more attention to their own environment.

People with primary education consider the micro region successful and rich, and they think that it has the potential to develop. Their opinion is significantly different from the opinions of the other two groups.

Based on the averages general satisfaction with the municipality can also be assessed, the respondents are most satisfied with the adequate supply of local nursery, primary and secondary schools and postal services. The major problems for them were job opportunities, income conditions and hospital care.

The principal component analysis of the responses for the question about the greatest problem at the municipality shows that the principal component that includes the first greatest common variance is related to agriculture. In the interpretation of the principal component the lack of integrated management, the lack of processing plants, inadequate farm structure, the decline of the construction industry related to agriculture and the decline in agricultural production were significant factors. Welfare services belong to the second principal component, while the third principal component includes variables which can be associated with the mobility of the workforce.

Investigating the importance of investments, it was found that the rank average of investments is similar based on the monthly net income and the educational level of respondents. The most significant investment areas are internal road construction and reconstruction, the development of the road network, hospital investments, the renovation of the drainage system, selective waste collection, the creation of cultural, sports and entertainment facilities, investments into tourism, the construction of the ring road built around Gyöngyös, the development of the basic services (the establishment of a micro regional logistics centre).

Based on an in-depth interview I presented that a specialist group of raspberries operated in Nagyréde from 1990 to 2000, and before that backyard farming was the dominant form of land cultivation. The integrated organizational structure worked from 2000 to 2010. This single specialist group provided some income for 1,433 people. In the same way micro regional logistics centre may integrate the cleaning, processing, packaging of the raw materials produced by family

farms and public work programmes and their delivery to the kitchens of the municipalities, and it may also sell the remaining products in its own network of shops. Logistics centres can be established in each micro region specializing in their own specific products. Finally, a cluster can integrate domestic production, processing and marketing.

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