

DIRECTION AND PACE OF CHANGES IN RURAL AREAS OF HIGHLY AND LESS URBANIZED REGIONS – A CASE STUDY

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Abstract. The purpose of this study was to characterize the scope, direction and pace of the evolution taking place in the rural part of highly and less urbanized regions, including without limitation changes to the territorial distribution and percentage of the rural population in the voivodeships covered by this study; the levels of the technical and social infrastructure; the condition of agricultural productive inputs and the level of the farms' commercial production; the development level of non-agricultural activities in rural areas. The source of information were books, magazines and publications of the Central Statistical Office (GUS). Once collected, the information was processed and interpreted with the use of a vertical and horizontal comparison method, the statistical method and the relative valuation method. It was found that: a) the rural population grows (and so does its share in the country' population) though rural areas become smaller in size, b) more and more rural areas are transformed into residential areas, improving the level of technical and social infrastructure, c) the Śląsk region is characterized by a slower evolution of the general and rural infrastructure compared to Świętokrzyskie voivodeship, d) the regions covered by this study demonstrate a high decrease rate of agricultural land resources, accompanied by the growth of other productive inputs and of agricultural commercial production, e) rural areas are increasingly engaged in economic activities covered by the REGON register. The characteristics and consequences of entrepreneurship are diversified across the rural areas under consideration. The most positive effects can be noted in Śląsk region.

Keywords: region, change, pace, direction, infrastructure

INTRODUCTION

Until 2000, on a regional and countrywide basis, there was growth of the urban population with a decline in the rural population, both in absolute and relative terms. This was accompanied by changes in the territorial scope of cities: the existing rural towns were converted into urban towns, and city limits were extended to cover rural areas, which is still the case today. Meanwhile, there was a heavy inflow of urban employees to suburban towns. Today, an opposite trend may be observed: the urban population decreases in absolute and relative terms while the rural population grows though rural areas become smaller in size.

Due to their territory, resources and roles in the economy and society, rural areas are of interest to scientists working across many disciplines. Nowadays, various development concepts are formulated for these areas: e.g. the sustainable development concept by Kapusta (2007, p. 120–127) and Adamska (2016, p. 242); spatial differentiation of development by Stanny (2013, p. 331); reasons for and manifestations of peripherality by Nurzyńska (2016, p. 123–139).

The results of this study are of a cognitive nature (as they contribute to the theory of modern regional development) while having a practical dimension (as they provide a basis for formulating and implementing sustainable development strategies).

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PURPOSE, SCOPE, INFORMATION SOURCES AND METHODOLOGY OF STUDIES

The purpose of this study was to characterize the scope, direction and pace of the evolution taking place in the rural part of highly and less urbanized regions, including without limitation changes to: a) the territorial distribution and percentage of the rural population in the voivodeships covered by this study; b) the levels of the technical and social infrastructure; c) the condition of agricultural productive inputs and the level of the farms' commercial production; d) the development level of non-agricultural activities in rural areas.

Two voivodeships (Śląskie and Świętokrzyskie) were covered by this study. Today, both of them evolve in the same direction as the entire country. Also, with its numerous industrial plants, the Śląskie voivodeship has for centuries been characterized by the highest share of the urban population. In turn, the Świętokrzyskie voivodeship is ranked 15th in terms of the urbanization level (the Podkarpacie region is ranked 16th). These are neighboring voivodeships who base their development on extracting and processing natural raw materials, have a properly developed transport infrastructure and many tourist facilities.

After Poland reclaimed independence in 1918, both voivodeships underwent many changes, especially as regards their territorial and self-government structures. Currently, both of them experience counterurbanization, just like the entire country: in the Śląskie voivodeship, the share of the urban population went down from 78.9% in 2003 to 77.1% in 2015 (a decline by 1.6 percentage points); in the Świętokrzyskie voivodeship, the corresponding figures were 45.7% and 44.6% (a decline by 0.9 percentage points); in Poland, that ratio decreased from 61.6% to 60.3% (a decline by 1.3 percentage points) (GUS, 2004, p. 68–69; GUS, 2016, p. 70–73). The magnitude and direction of changes taking place in Polish rural areas were a reference point for assessing those taking place in the voivodeships.

To track this evolution, two snapshots were selected: 2003 (the last year prior to the Poland's accession to the EU) and 2014 or 2015 (the most recent statistical data available). To eliminate the impact of change fluctuations in the agriculture, multiannual average data was used. The source of information were books, magazines

and publications of the Central Statistical Office (mainly yearbooks).

Once collected, the information was processed and interpreted with the use of a vertical and horizontal comparison method (Kapusta, 1976, p. 11–12; Stachak, 2003, p. 213–216), the statistical method (Stachak, 1997, p. 132–133), and with the relative valuation of infrastructure components (Kapusta, 2006, p. 35–52). The relative valuation method merits reflection because of its simplicity and relative assessment of the infrastructure condition. Generally, it consists in comparing the infrastructure condition in a territorial unit with corresponding countrywide data to adequately assess the advantage or disadvantage (weakness) of a specific type of infrastructure. Afterwards, the results are added to calculate the average figures for the territorial unit under consideration. This is the basis for concluding whether a territorial unit is advantaged or disadvantaged compared to countrywide figures. W_i was calculated as follows:

$$W_i = (I_b / I_k) \times 100 \quad (1)$$

with:

W_i – infrastructure index,

I_b – condition of a single infrastructure component of the territorial unit under consideration,

I_k – condition of that infrastructure component in the country.

The level of specific infrastructure components in the regions covered by this study was compared to corresponding indexes calculated for rural areas on a countrywide basis.

The results are presented in tables together with a verbal description.

RESULTS AND DISCUSSION

General characteristics of voivodeships covered by this study

In the Śląskie voivodeship, rural areas represent 69.3% of the territory and are inhabited by 22.8% of the population. The corresponding figures for the Świętokrzyskie voivodeship are 94.3% and 55.4% (Table 1). In both voivodeships, the share of the rural population increased over the 2003–2014 period (although the Świętokrzyskie voivodeship has a smaller population).

The evolution of the urban and rural population is primarily affected by the population growth rate and

Table 1. Rural areas in Poland and in Śląskie and Świętokrzyskie voivodeships

Specification	Year	Area		Population	
		thous. sq. km	% of land area	thous.	% of population
Poland	2003	29 1474	93.2	14 677.2	38.4
	2014	29 1071	93.1	15 262.3	39.7
Śląskie voivodeship	2003	8543	69.3	994.8	21.1
	2014	8 543	69.3	1043.3	22.8
Świętokrzyskie voivodeship	2003	11 037	94.4	702.0	54.4
	2014	11 042	94.3	699.3	55.4

Source: GUS and US w Olsztynie, 2011, p. 98–101; 2016, p. 64–65, 80, 82–83; GUS, 2016, p. 70–73.

migration. In 2014, the population growth rate in Polish rural areas was positive and equaled 0.7 per 1,000 population whereas in urban areas it reached a negative level of 0.5. Since 2006, that rate has grown by 0.1 in rural areas and has decreased by 0.3 in urban areas. Negative values of the population growth rate in rural areas were recorded in the Świętokrzyskie voivodeship (and in other voivodeships). In turn, an increase in the population growth rate was reported in the Śląskie voivodeship (GUS and US w Olsztynie, 2016, p. 133). In turn, the dominating domestic migration direction in 2014 was the outflow of the urban population to rural areas, both in the voivodeships covered by this study and on a countrywide basis (GUS and US w Olsztynie, 2014, p. 138).

Both regions demonstrate similar agricultural conditions. The valuation index for the agricultural production space is 64.2 (for the Śląskie voivodeship), 69.3 (for the Świętokrzyskie voivodeship) and 66.6 (countrywide average level). This means the valuation index for the agricultural production space in the Świętokrzyskie voivodeship was by 2.7 points (i.e. by 4.1%) higher than the national average. In the Śląskie voivodeship, that index was by 2.4 points (i.e. by 3.6%) lower than the national average (Kapusta, 2012a, p. 127). Both voivodeships have a large farming population which grew over the period covered by this study.

Evolution of the technical and social infrastructure in rural areas

Infrastructure means technical measures and institutions necessary to ensure the proper course of production and service activities and to develop the desired living

conditions for the population. Multiple definitions exist for the infrastructure and its related terms (Kapusta, 2006, p. 35–44). Among all infrastructure types, the ones classed as technical and social infrastructure have the greatest impact on the population's living conditions and activity. The infrastructure topics are addressed as follows:

- Evolution of selected components of the technical and social infrastructure in 2003 and 2015 in Poland and in Śląskie and Świętokrzyskie voivodeships. This infrastructure is available both to the rural and urban population;
- Evolution of selected infrastructure components in 2003 and 2015 in Polish rural areas and in the voivodeships covered by this study.

Each time, countrywide data was used as the baseline for comparison. When assessing the infrastructure level, the items for which 2003 and 2015 information was available (or could be calculated) were taken into consideration.

This study used 5 infrastructure components in Poland and specific regions, and 16 technical and social infrastructure components in rural areas. All of them are variables with a stimulating effect, and are calculated based on, or originate from, statistical materials. The results are shown in Table 2.

In the period under consideration, different trends may be observed in the country and in the voivodeships:

- In both voivodeships, the general infrastructure development rate is lower than the corresponding countrywide figures (by 5.0 points in the Śląskie voivodeship and by 26.4 points in the Świętokrzyskie

Table 2. Different levels of technical and social infrastructure in rural areas of Poland and of Śląskie and Świętokrzyskie voivodeships in 2003 and 2015

Specification	Polish rural areas		Śląskie				Świętokrzyskie					
	2003	2015	2003	W_i	2015	W_i	L	2003	W_i	2015	W_i	L
1	4	6	9	10	11	12	13	14	15	16	17	18
General infrastructure												
Railways (km/100 km ²)	6.5	6.2	18.4	283.1	16.0	258.1	1	6.2	95.4	6.2	100.0	2
Hard surfaced roads (km/100 km ²)	79.6	93.0	161.8	203.3	175.5	188.7	1	100.0	125.6	120.6	129.7	2
Protected forest area (%)	37.3	41.2	72.2	193.6	74.0	179.6	1	47.9	128.4	47.5	115.3	2
Environmental expenditure (PLN/inhabitant)	135	394	143	105.9	438	111.2	1	78	57.8	370	93.9	2
Water management expenditure (PLN/inhabitant)	45	86	41	91.1	98	114.0	1	89	197.8	46	53.5	2
Hospital beds per 10,000 population	48.7	48.6	58.3	119.7	55.8	114.8	1	46.4	95.3	50.2	103.3	2
Mean W_i	x	x	x	166.1	x	161.1	x	x	116.7	x	99.3	x
Rural infrastructure												
Rooms per dwelling	4.06	4.34	4.35	107.1	4.69	108.1	1	3.78	93.1	4.01	92.4	2
Usable floor area	84.5	92.7	89.2	105.6	98.8	106.6	1	80.8	95.6	85.9	92.7	2
Usable floor area per capita (m ² /person)	23.9	27.9	26.9	112.6	30.2	108.2	1	23.4	97.9	26.7	95.7	2
Number of dwellings per 100 population	28.2	30.1	30.1	106.7	30.6	101.7	2	29.0	102.8	31.1	103.3	1
Number of rooms per 100 population	114.9	129.9	131.6	114.5	142.9	110.0	1	108.7	94.6	125.0	96.2	2
Dwellings equipped with:												
running water	88.0	92.0	94.4	107.3	96.2	104.6	1	79.4	90.2	86.6	94.1	2
WC	73.1	86.1	84.6	115.7	93.0	108.0	1	59.2	81.0	76.3	88.6	2
bathroom	74.5	82.4	86.0	115.4	89.9	109.1	1	61.5	82.6	72.8	88.3	2
gas pipe	17.4	21.3	28.0	160.9	30.5	143.2	1	8.1	46.6	9.9	46.5	2
central heating	63.1	70.9	77.1	122.2	81.5	115.0	1	59.3	94.0	66.1	93.2	2
Number of dwellings built per 1,000 population	4.7	3.7	6.8	144.7	3.2	86.5	1	3.8	80.9	2.8	75.7	2
Number of dwellings built per 1,000 marriages	901	730	1376	152.7	657	90.0	1	711	78.9	566	77.5	2
Usable floor area of a newly built dwelling (m ²)	134.1	134.1	134.4	100.2	142.3	106.1	1	132.2	98.6	127.4	95.0	2
Population served by sewage treatment plants	16.5	39.6	16.9	102.4	45.3	127.2	1	11.7	70.9	34.7	7.6	2
Number of post offices per 10,000 population	3.16	1.92	2.62	89.9	1.72	89.6	2	2.76	55.7	2.00	104.2	1
Children in kindergartens (%)	35.5	5.1	49.6	139.7	81.9	125.8	1	3.5	94.4	64.9	99.7	2
Mean W_i	x	x	x	118.6	x	108.7	x	x	84.9	x	89.4	x

Sources: own calculations based on: GUS, 2004, p. 354–356, 372, 483, 513, 516, 533, 597–598, 606; GUS, 2016, p. 34–35, 186, 192, 196, 344–345, 348, 362, 404, 412, 500, 519; GUS and US w Olsztynie, 2010, p. 144–146, 151, 153, 154, 156.

voivodeship). However, as regards the general infrastructure level, the Śląskie voivodeship demonstrates a tremendous advantage over the country and over the Świętokrzyskie voivodeship. Compared to the countrywide baseline figures, the Śląskie voivodeship achieved progress in two infrastructure areas (protected forests area and environmental expenditure) while recording a downward trend in other ones. In the Świętokrzyskie voivodeship, progress was reported in four areas (railways, hard surfaced roads, environmental expenditure and water management expenditure) with a retrogressive development in two areas (protected forests area and water management expenditure). In 2015, the Śląskie voivodeship outperforms the country in all areas whereas the Świętokrzyskie voivodeship does so only in three areas (hard surfaced roads, protected forests area and water management expenditure).

- As regards rural infrastructure, different evolution paths may be observed in both voivodeships. Compared to the countrywide baseline figures, the rural infrastructure score for the Śląskie voivodeship

changed from 118.6 in 2003 to 108.7, which means a decrease by 9.9 (i.e. by 8.3%), whereas in the Świętokrzyskie voivodeship it went up from 84.9 to 89.4, i.e. by 4.5 (5.3%).

Thus, the rural infrastructure in the Śląskie voivodeship develops at a slower rate than the country while that in the Świętokrzyskie voivodeship outperforms the country. However, in 2015, the mean level of rural infrastructure in the Śląskie voivodeship was higher than the countrywide level by 8.7 points while the corresponding score for the Świętokrzyskie voivodeship was 10.6 points below the countrywide level. The Śląskie voivodeship is outperformed by the Świętokrzyskie voivodeship only as regards two infrastructure aspects, i.e. dwellings per 100 population and post offices per 10,000 population.

Condition and evolution paths of the agriculture

Table 3 shows a summary of changes in basic productive inputs and commercial production volumes of the agricultural sector.

Table 3. Changes in productive inputs and commercial production volumes of the agricultural sector

Specification	Poland			Śląskie			Świętokrzyskie		
	2001–2003	2013–2015	Difference (2–3)	2001–2003	2013–2015	Difference (5–6)	2001–2003	2013–2015	Difference (8–9)
1	2	3	4	5	6	7	8	9	10
Agricultural land (%)	100.0	86.0	–14.0	100.0	69.3	–30.7	100.0	74.3	–25.7
Workers per 100 ha AL	12.4	16.0	+3.6	13.1	27.0	+13.9	21.6	30.3	+8.7
Capital expenditure (PLN/ha AL)	124	353	+229	118	403	+285	115	280	+165
Gross value of fixed assets (PLN/ha)	6 527	9 450	+2 923	8 727	14 647	+5 920	6 836	10 626	+3 790
Number of ha of agricultural land per tractor	12.36 ¹	10.15 ²	–2.21	9.81 ¹	7.89 ²	–1.92	8.85 ¹	5.99 ²	–2.86
Purchase of agricultural products (crop units per ha AL)	28.2 ³	39.1	+16.3	16.0/3	35.8	+19.8	11.9/3	23.2	+11.3

¹ As at 2003. ² Mean value for 2013–2014. ³ Mean value for 2002–2003.

Source: own calculations based on: GUS, 2005, p. 192–194, 224–225, 234, 236, 238; GUS, 2014, p. 90–91, 150; GUS, 2015, p. 84, 127, 131, 133–134; GUS, 2016, p. 84, 127, 131, 133.

In the period under consideration (2001–2003 and 2013–2015), both voivodeships experienced a significant decline in the agricultural land area: by 30.7% in the Śląskie voivodeship and by 25.7% in the Świętokrzyskie voivodeship (compared to a decrease by 14.0% on a countrywide basis). There was an increase in labor resources per 100 ha of agricultural land: by 3.6 AWU (29.0%) on a countrywide basis; by 13.9 AWU (106.1%) in the Śląskie voivodeship; and by 8.7 AWU (40.3%) in the Świętokrzyskie voivodeship. The gross value of fixed assets per ha of agricultural land reaches the highest level in the Śląskie voivodeship where the highest increase of capital expenditure was also recorded; ranked second was the Świętokrzyskie voivodeship while the country's overall figures were the lowest ones. The smallest agricultural land area per tractor was reported in the Świętokrzyskie voivodeship, followed by the Śląskie voivodeship, both of them having a better score than the country's overall figures. In the period under consideration, there was a general decrease in the agricultural land area per tractor: by 2.21 ha on a countrywide basis; by 1.92 ha in the Śląskie voivodeship; and by 2.86 ha in the Świętokrzyskie voivodeship. Changes in productive inputs are accompanied by a change to the number, average size and structure of farms. In the 2002–2013 period, the number of farms decreased by 28.7% on a countrywide basis; by 48.7% in the Śląskie voivodeship; and by 29.7% in the Świętokrzyskie voivodeship. There is an increase in the average size of farms, measured in hectares of agricultural land: from 8.44 ha to 10.20 ha (by 20.9%) on a countrywide basis; from 4.41 ha to 6.60 ha (by 47.4%) in the Śląskie voivodeship; and from 4.48 ha to 5.50 ha (by 13.6%) in the Świętokrzyskie voivodeship (GUS, 2005, p. 214–215; GUS, 2014, p. 507). Thus, the fastest evolution of the number and average size of farms takes place in the Śląskie voivodeship while the slowest pace of changes may be observed in the Świętokrzyskie voivodeship.

There is an increase in the commercial production volume expressed in crop units per hectare of agricultural land. The highest increase in the volumes of purchased goods was recorded in the Śląskie voivodeship (+19.8), followed by the countrywide rate (+16.3) and the Świętokrzyskie voivodeship (+11.3). Both voivodeships report purchase volumes below the countrywide level, with the Świętokrzyskie voivodeship being ranked at the bottom.

Condition and evolution paths of non-agricultural activities in rural areas

Because of their resources, rural areas also the basis for developing non-agricultural businesses, as reflected by the increased numbers of economic operators registered in the REGON system per 1,000 population (Table 4). In the 2003–2014 period, the highest increase in the number of economic operators (+25.9%) was recorded on a countrywide basis. Ranked next were the Śląskie and (+20.0%) and Świętokrzyskie (+15.5%) regions. Nevertheless, in 2014, the highest and the lowest density of economic operators was recorded, respectively, in

Table 4. Selected economic development indicators for rural areas in Poland and in voivodeships covered by this study

Specification	2003	2014	Increase	%
National economy operators entered to the REGON register per 1,000 population				
Poland	58	73	15	25.9
Śląskie	71	82	11	15.5
Świętokrzyskie	50	60	10	20.0
Professional activity ratio (%)				
Poland	55.8	56.3	0.5	0.9
Śląskie	48.1	51.8	3.7	7.7
Świętokrzyskie	52.5	58.0	5.5	10.5
Employment rate (%)				
Poland	45.9	50.9	5.0	10.9
Śląskie	39.3	47.0	7.7	19.6
Świętokrzyskie	44.6	52.2	7.6	17.0
Unemployment rate (%)				
Poland	17.8	9.5	-8.3	46.6
Śląskie	18.3	9.2	-9.1	49.7
Świętokrzyskie	15.1	10.1	-5.0	33.1
Employed persons per 1,000 population				
Poland	82.3	108.8	26.5	32.2
Śląskie	106.2	127.5	21.3	20.1
Świętokrzyskie	63.3	80.0	16.7	20.0

Source: own calculations based on: GUS and US w Olsztynie, 2011, p. 106–109; 2016, p. 88–95.

the Śląskie voivodeship (82) and in the Świętokrzyskie voivodeship (60), with the country's overall result being 73. That ratio is correlated with the (technical and social) infrastructure level (Kapusta, 2012b, p. 324).

The development of operators active in non-agricultural sectors in rural areas and the circular migration are the factors that promote professional activity of the rural population. The characteristics and consequences of entrepreneurship are diversified across the territorial units under consideration. The highest number of positive effects may be observed in the Śląsk region (the highest number of operators entered to the REGON register; the lowest unemployment rate; the highest number of employed persons per 1,000 population) whereas only two positive effects can be identified in the Świętokrzyskie region (the highest professional activity rate; the highest employment rate).

Considering the type of activity run by national economy operators (grouped by sections of the 2007 Polish Classification of Economic Activity), it was found that, on a countrywide basis in 2014, the largest number of operators were active in trading and repairing automotive vehicles (25.9%); in the Śląsk and Świętokrzyskie regions, this activity was ranked 5th (with a share of 27.4%) and 1st (with a share of 29.9%), respectively. Ranked second in the country were the construction companies (16.2%); in the Śląsk and Świętokrzyskie regions, this activity was ranked 12th (with a share of 15.1%) and 4th (with a share of 17.5%), respectively. Ranked third were the industrial companies (12.1%); in the Śląsk and Świętokrzyskie regions, this activity was ranked 3rd (with a share of 14.0%) and 6th (with a share of 12.2%), respectively (Central Statistical Office, Statistical Office, 2016, p. 174–175).

SUMMARY

1. As shown by the (horizontal and vertical) analysis of Śląsk and Świętokrzyskie regions compared to countrywide data, their rural areas demonstrate a different direction and pace of changes in many fields. However, a decline in the urbanization ratio was characteristic of all territorial units under consideration.

2. Each year, more and more rural areas are transformed into residential areas; that process is driven by the improvement of the technical and social infrastructure. The Śląsk region (with the highest urbanization

rate) demonstrates a smaller growth rate of the infrastructure level.

3. Both regions offer similar agricultural production conditions. The valuation index for the agricultural production space in the Świętokrzyskie region was by 4.1% higher than the national average. In the Śląsk region, that index was 3.6% below the country's overall level.

4. Agricultural productive inputs undergo considerable changes; there is a decline in land area and a growth of other productive inputs.

5. The volumes of commercial production tend to grow. During the period under consideration, the highest increase in the volumes of goods purchased (in crop units per ha of agricultural land) was recorded in the Śląsk region (slightly above the countrywide level) whereas the lowest increase was reported in the Świętokrzyskie region. Also, the Świętokrzyskie region demonstrated the lowest volumes of goods purchased per ha of agricultural land.

6. Operators entered to the REGON register become increasingly active in rural areas. The characteristics and consequences of entrepreneurship are diversified across the territorial units under consideration. The highest number of positive effects may be observed in the Śląsk region (the highest number of operators entered to the REGON register; the lowest unemployment rate; the highest number of employed persons per 1,000 population) whereas only two positive effects can be identified in the Świętokrzyskie region (the highest professional activity rate; the highest employment rate).

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