

## Seeking interrelations between the level of social and economic development and the indicators of the economic and production disagrarisation of farms

### W poszukiwaniu wzajemnych zależności między poziomem rozwoju społeczno-gospodarczego a wskaźnikami ekonomiczno-produkcyjnej dezagraryzacji gospodarstw rolnych

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**Abstract.** Disagrarisation can be looked at from a broad perspective, when referred to the social and economic processes taking place in rural areas, or from a narrower perspective, when related to farms (as understood by the Polish law). In the latter case, production and economic aspects come first. The study attempted at measuring the interrelations between the level of social and economic development of a local administrative entity (county) and the indicators of the processes of the economic and production disagrarisation of farms located therein (share of land with agriculture in poor condition; organisational intensity of agriculture). It was found that the indicators of economic and production disagrarisation assumed high values both in the counties that achieved high scores for their level of social and economic development, and in those with low scores. However, the causes of the considerable advancement of disagrarisation differ between the two groups of counties. The factor that supports the continuation of production and helps in maintaining the importance of incomes earned from agriculture is, among others, the favourable natural conditions of agricultural production.

**Keywords:** disagrarisation • Małopolska and Pogórze region • farms • social and economic development • rural areas

**Streszczenie.** Pojęcie dezagraryzacji można rozumieć w szerokim ujęciu – w odniesieniu do procesów społeczno-ekonomicznych zachodzących na obszarach wiejskich, jak

również w ujęciu węższym – w odniesieniu do podmiotów funkcjonujących w polskim prawie jako gospodarstwa rolne. W tym drugim przypadku na pierwszy plan wysuwają się aspekty produkcyjno-ekonomiczne. W opracowaniu podjęto próbę pomiaru zależności między poziomem rozwoju społeczno-gospodarczego jednostki lokalnej (powiatu) a wskaźnikami procesów produkcyjno-ekonomicznej dezagrarnizacji położonych na jej terenie gospodarstw rolnych (udział użytków rolnych o złej kulturze rolnej; organizacyjna intensywność rolnictwa). Przeprowadzona analiza wykazała, że wskaźniki dezagrarnizacji produkcyjno-ekonomicznej przyjmują wysokie wartości zarówno w powiatach o wysokiej, jak i tych o niskiej ocenie poziomu rozwoju społeczno-gospodarczego, odmienne są natomiast przyczyny dużego zaawansowania procesu dezagrarnizacji w tych dwóch grupach jednostek. Do czynników sprzyjających kontynuowaniu produkcji oraz podtrzymywaniu znaczenia dochodów uzyskiwanych z rolnictwa należą m.in. korzystne dla produkcji rolniczej warunki przyrodnicze.

**Słowa kluczowe:** dezagrarnizacja • region Małopolska i Pogórze • gospodarstwa rolne • obszary wiejskie • rozwój społeczno-gospodarczy

## Introduction

Currently, the European agriculture can be considered as being in a state of transition. The character of the changes occurring therein depends on the country, and is largely determined by its specific history of agrarian development. Contrary to expectations, the processes of integration taking place in the whole European economy, and particularly in agriculture, have not solved the agrarian heritage problems of individual countries, or removed the differences in the importance of agriculture to the economy and agricultural structures, resulting from, among others, the mental and cultural diversity (Musiał, 2007).

The agrarian thought in Western Europe emphasises the importance of multi-functional agriculture and a substantial number of farms to ensuring the useful role of agriculture in sustainable rural development. “To maintain the European model of agriculture and rural areas, it is necessary to meet the challenges of reconciling economic functions with non-economic ones, internalising external effects into the economic account, preserving the natural and cultural values of the countryside, protecting villages against depopulation and loss of landscape assets, and protecting family farms” (Zegar, 2012, p. 15).

It is worth remembering that the processes observed in agriculture and in rural areas do not occur in isolation, but as part of the time and socio-economic space, to which they have a causal relationship (Wigier, 2012). In this light, it appears important to investigate the correlations between the level of socio-economic development of a particular territory and the scale of the phenomenon of production and economic disagrarnisation of agricultural farms. As shown by some studies, agriculture is high on the list of factors responsible for the low development level of regions (Boldrin and Canova, 2001). The rate and scope of transformation in rural areas, and its effects on both the local economy and the inhabitants are a consequence of changes taking place on a broader, mesoeconomic or even macroeconomic scale. Therefore, the observed phenomenon of the gradual abandonment of agricultural production by farm owners

should be verified empirically, and examined in the varied socio-economic context in which it occurs.

The main objective of this study was to identify the factors contributing to the disagrarisation and extensification of agricultural production. The following research hypothesis was formulated:

*H<sub>1</sub>: The high socio-economic development of a territorial unit fosters the production and economic disagrarisation of agricultural farms within its boundaries.*

## Material and methods

The rural counties of the Małopolska and Pogórze macroregion were delimited in terms of socio-economic development and the organisational intensity of agriculture. The macroregion consists of four voivodeships of south-eastern Poland: Małopolskie, Podkarpackie, Śląskie, and Świętokrzyskie.

### Measuring the level of socio-economic development

The selection of time periods and of explanatory variables was determined by the availability of statistical data. The calculations were made for the year 2010 using the data from the Local Data Bank of the Central Statistical Office ([www.stat.gov.pl](http://www.stat.gov.pl)).

Based on an analysis of the available statistical data and the literature on the subject (i.a., Jaworska and Luty, 2009; Stanny, 2010; Wojewodziec, 2003), a set of eight characteristics best describing (according to the authors) the level of socio-economic development was identified, three of which with a nature of destimulants (D), and the others, stimulants (S). The explanatory variables were as follows:

- 1) number of business entities per 10 thousand people of working age (S),
- 2) average monthly gross salary (S),
- 3) income *per capita* in the municipality (S),
- 4) net migration rate<sup>1</sup> of people of working age (migration for permanent residence, between counties and abroad) (S),
- 5) number of foundations, associations and social organisations per 10 thousand inhabitants (S),
- 6) registered unemployment rate (D),
- 7) proportion of people registered as unemployed in the number of people of working age (D),
- 8) persons in families on welfare as percent of the total population (D).

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<sup>1</sup> Net migration for permanent residence of the population of a certain age per 10 thousand people of this age. (The indicators relating to the number and structure of the population (gender, age group) of 2010 were recalculated in accordance with the results of the National Census 2011 ([www.stat.gov.pl](http://www.stat.gov.pl))).

Two of the eight variables were constructed on the basis of the number of unemployed persons in order to highlight the importance of the availability of jobs to the course of economic and social processes. The inevitably subjective choice of the above-mentioned factors (other factors that could have an impact on the phenomenon studied were omitted from the analysis) may give rise to controversy. The authors, however, assumed that socio-economic development is primarily to serve man, and the latter objective is in conflict with high unemployment. The substantial level of unemployment makes it difficult to fully exploit the economic potential, on the one hand, and contributes to the accumulation of social problems, on the other.

To describe the level of socio-economic development, a synthetic measure was constructed employing the zeroed unitarisation method. To do so, the explanatory variables were standardised using appropriate mathematical formulas. These were as follows:

- for stimulants (S) (for which a high value is desirable):

$$Z_{ij} = \frac{x_{ij} - \min x_{ij}}{\max x_{ij} - \min x_{ij}}$$

- for destimulants (D):

$$Z_{ij} = \frac{\max x_{ij} - x_{ij}}{\max x_{ij} - \min x_{ij}}$$

The standardised variables  $Z_{ij}$  obtained in the above way assume values from the range [0, 1], where “1” represents an object with the most favourable value of a given variable, and “0” the one with the least favourable value (Kukuła, 2000).

The synthetic measure of socio-economic development (*SED*) was calculated as an arithmetic mean of the normalised explanatory variables for a given territorial unit. The resulting value is relative and must lie within the range (0, 1), with a higher value indicating a higher level of socio-economic development.

## Measuring the level of production and economic disagrarisation

The literature on the subject does not mention any methods for measuring the advancement of disagrarisation. Therefore, the assessment of this phenomenon was based on three intermediate indicators describing the production and economic aspects of the functioning of agricultural farms (as understood by the applicable law):

- 1) intensity of agriculture organisation<sup>2</sup>,
- 2) percentage of farms without income from agricultural activities,
- 3) share of agricultural land in poor agricultural condition in the structure of arable lands.

<sup>2</sup> A low density of livestock and a high proportion of extensive crops and fallows in the structure of arable lands reduce the value of potential intensity, and thus indirectly reflect the scale of disagrarisation.

The potential intensity of agriculture organisation ( $I_o$ ) was evaluated using a method proposed by Kopeć (1978). The method, despite its limitations, allows a synthetic assessment of the organisation intensity for plant production ( $I_p$ ), and for livestock production ( $I_A$ ). This is performed using the following formulas (the intensity factors,  $S_p$  and  $S_A$ , take into account the potential labour and capital requirements of a given activity):

$$I_p = \sum W_p \cdot S_p \quad \text{and} \quad I_A = \sum P_A \cdot S_A$$

where:

- $W_p$  – share of a given crop in the structure of arable lands,
- $S_p$  – intensity factor for the crop,
- $P_A$  – density of a given animal species (expressed in SD/100 ha of arable land),
- $S_A$  – intensity factor for the animal species.

The intensity of organisation was assessed using a scale proposed by Kopeć (1978): extensive (< 200 pts), of low intensity (200–250 pts), of medium intensity (250–300 pts). No counties<sup>3</sup> in the examined area showed a high (300–350 pts) or very high (> 350 pts) intensity of agriculture organisation.

To verify the hypothesis  $H_1$ , the correlation between the level of socio-economic development and the level of production and economic disaggregation was studied using Pearson's correlation coefficient ( $r_{xy}$ ).

The spatial variation in the examined phenomena was presented on maps where units with highest and lowest values of the respective indicators (extreme quartile groups: I and IV) were distinguished.

## Results and discussion

### Socio-economic development

The issues related to the socio-economic development processes occurring at a regional or local scale are frequently discussed in the contemporary economic literature, and receive a lot of attention from specialists in such fields of science as sociology, regional policy, geography (especially economic geography), management, or spatial economy. The fact that the representatives of such diverse sciences have taken interest in the course of the development processes can be considered as an evidence of their complexity and multi-dimensionality, and the multitude of factors behind them.

Because of the diversity of factors influencing local and regional development, they are usually divided into two groups: internal (endogenous) factors and external (exogenous) factors. It is sometimes difficult to univocally assign a particular factor to one of these categories. Nevertheless, defining the role of internal and external factors in the local and regional development is not only scientifically relevant, but it is also necessary in the practical management of local development (Gorzela, 2000).

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<sup>3</sup> Urban counties, due to their specificity and a marginal significance of agriculture for their area, were omitted from the study.

According to the convergence hypothesis, regions with weaker factors of production are not necessarily doomed to a poorer development. They may fill in the development gap by copying the dynamics of development of the wealthier regions, which is a characteristic feature of exogenous development.

The national development programmes that are implemented in a country should take rural areas, agriculture, and agribusiness into consideration (Tomczak, 2006). This is particularly important for Poland where historical processes have created specific conditions that lead to a development gap separating rural areas from urban ones. Failure to consider such a fact would cause the adopted development programmes to be incomplete. As a result, part of the country would be prevented from following the path of economic expansion, and a portion of society would be condemned to marginalisation; also the progress of civilisation would be hampered. Nowadays, social marginalisation is not a rare phenomenon, and it will continue to affect various social groups. What is the most worrying, is that it affects a substantial part of the rural youth who live in areas distant from large urban centres and major transport routes (Kowalska, 2010).

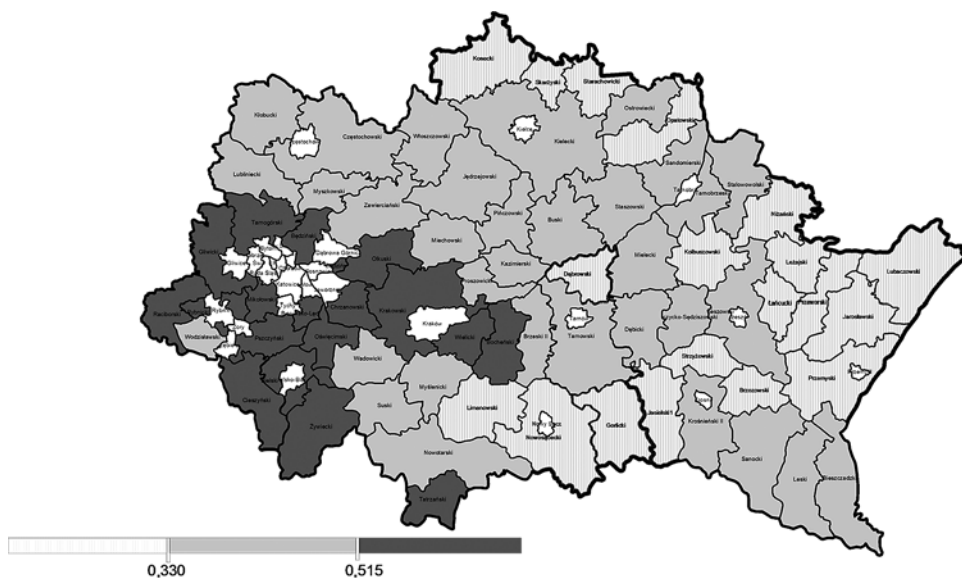
Despite the dynamic changes occurring in the global economy, agriculture in general continues to be of great importance for three areas: economic growth and development; living conditions of the population; and environmental services (Adamowicz, 2008). The weight of individual areas varies between different countries and depends on their level of socio-economic development as well as the advancement of structural changes in their economies, but also on the stage in the process of transition from an economy based on agriculture, through an industrialised economy, to an economy characteristic of post-industrial society.

In urbanised and industrialised countries, the direct production-related significance of agriculture is little both in terms of employment (it absorbs 2–3% of the working population), and national income (it generates 1–3% of GDP). It should be noted, however, that this sector of the economy in such countries is highly developed, and forms a basis for broadly-understood agribusiness comprising the processing industry and the services sector. Agribusiness, in this sense, produces a significantly greater share of GDP and employs more people than agriculture itself. Achieving high development levels of agriculture and agribusiness is possible due to the high level of economic development of the country (abundance, wealth), and often results from the substantial public subsidies given to agriculture.

Regardless of the diminishing contribution of agriculture to the gross domestic product and the employment, its role is indisputable (what changes, however, is its functions). Agriculture is the first link in the food chain, and an essential part of the national economy system (Ziętara, 2008). The legislation on economic issues and the changes occurring in the economy under the influence of market forces significantly affect agriculture. The internal market mechanisms and the pressure of international competition force some farms to pursue strategies typical of commercial entities making the maximisation of profits their main objective (Sobiecki, 2007). Such processes result in the polarised agriculture, where apart from high-performance, market-orientated entities there is a group of multifunctional farms or farms with only social functions.

Nowadays, the perception of the countryside is changing both in public consciousness and economic policy (especially agricultural and regional). Rural areas are no longer regarded as monofunctional areas, that is ones based solely on agriculture, but as multifunctional areas, fulfilling various economic, social, environmental, cultural, and spatial functions on a local, regional, and national scale (Kłodziński, 2010; Kutkowska, 2012; Wilkin, 2011).

The Małopolska and Pogórze macroregion was found to be highly polarised in terms of socio-economic development (Fig. 1). Not surprisingly, the rural counties with a higher rating for this parameter were those located around thriving economic centres, such as Kraków, Bielsko-Biała, and the Silesian conurbation.



**Fig. 1.** Synthetic evaluation of the economic and social level of land counties (excluding townships) in the Małopolska and Pogórze region in 2010

**Ryc. 1.** Syntetyczna ocena poziomu rozwoju społeczno-gospodarczego powiatów ziemskich (z wyjątkiem powiatów grodzkich) regionu Małopolska i Pogórze w 2010 r.

*Source:* Authors' calculations based on the data from the Local Data Bank of the Central Statistical Office (retrieved 11.02.2014 from: [www.stat.gov.pl](http://www.stat.gov.pl))

*Źródło:* Obliczenia własne na podstawie danych z Banku Danych Lokalnych GUS (pobrane 11.02.2014 z: [www.stat.gov.pl](http://www.stat.gov.pl))

The highest scores for the level of socio-economic development were received by two counties: Wielicki (0.681), and Krakowski (0.659). The Tatrzański county, which is a specific economic centre, ranked third (0.656). Poorly developed counties lied in the eastern and northern parts of the macroregion. The counties with lowest scores were: Strzyżowski (0.164), Brzozowski (0.170), and Nizański (0.182).



## Disagrarisation as a result of changes in rural areas

The concept of disagrarisation is ambiguous and multifaceted, and therefore difficult to define. As a subject of scientific inquiry, it mainly concerns agriculture in a macro- and microeconomic dimension. In the former case, it mostly regards economic policy (including agricultural policy), whereas in the latter case, it refers to business entities (including agricultural farms). The disagrarisation process may be of interest to many scientific disciplines, such as economics, sociology, ethnography, or spatial economy. On the grounds of economics, “disagrarisation ought to be considered as a process and a phenomenon appearing in a given historical period, as an existing state of development, as well as a course of inevitable consequences or reversible changes having their scale, intensity and dynamics” (Musiał, 2007, p. 31).

Disagrarisation can be defined as a process of reducing the use of the factors of production, i.e. land, labour and capital, that were previously involved in agricultural activities. It is worth noting that it does not occur through the substitution of production factors with each other (e.g. substitution of the labour factor with the capital factor), or through an increase in productivity (e.g. a rise in crop yield per unit area) which makes it possible to reduce the area of land allocated to cultivation and thereby eliminate marginal lands.

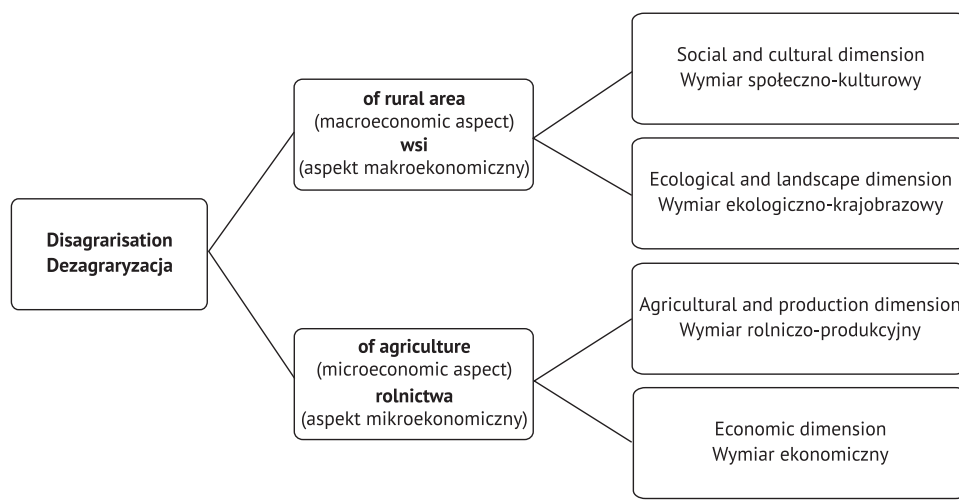
In terms of land, disagrarisation consists in changing the manner of its use, reducing the amount of cultivated land, leaving land fallow, or converting it in wasteland. In terms of capital, disagrarisation means reducing the capital employed in agriculture through a decrease in capital investment or the aging of the components of production assets (fixed and current assets). In terms of labour, progressive disagrarisation is reflected in a decrease in the number of those employed per unit of the invested capital (land), or in qualitative changes in the human capital employed in production (decrease in the formal and informal qualifications and the actual skills of the staff).

When viewed from a broader perspective – that of a rural area – disagrarisation has mainly socio-cultural as well as ecological and landscape dimensions (Fig. 2). In the rural environment in which farmers live, disagrarisation manifests itself chiefly in the declining importance of agriculture as a source of income, and thus in the diminishing importance of farmers as a social group in the socio-cultural life of rural communities. In macroeconomic terms, disagrarisation is seen in the decreasing working population and the falling percentage of people living off agriculture, the declining share of income derived from agriculture in the total income of rural residents, as well as the shrinking area of land used for agricultural purposes. All this reduces the importance of agriculture in generating the national income, and lowers the position of farmers in society (especially rural one) (Augustyńska-Grzymek, 2012).

In microeconomic terms, disagrarisation refers mainly to the agricultural production aspect and the economic aspect of the activity of a farm (production and economic disagrarisation). The diminishing scale of production, including the production of goods, has a negative impact on the economics of the entities administering the resources of agricultural land.



Regardless of the method of measurement, disagrarisation shows great variability with time. It was observed that the dynamics of this process increases in periods of transition. In Poland, the disagrarisation process clearly accelerated after 2000, and the average annual rate of the fall in the number of people employed in agriculture increased from 0.1 to 0.75 percentage points after the accession to the EU (Halamska, 2011). The dynamics of disagrarisation displays a relationship with both the current economic situation and the objectives and directions of the economic policy pursued by the country. Such interrelations are clearly visible at a high level of data aggregation (e.g. a national level), but are less visible or invisible at a local level. This is due to the fact that certain solutions in the field of economic policy are implemented by the government at a central level, and relate to the territory of the whole country. Local authorities have incomparably lower financial capabilities and less powerful tools to animate the processes of socio-economic transformations.



**Fig. 2.** Measures and aspects of disagrarisation

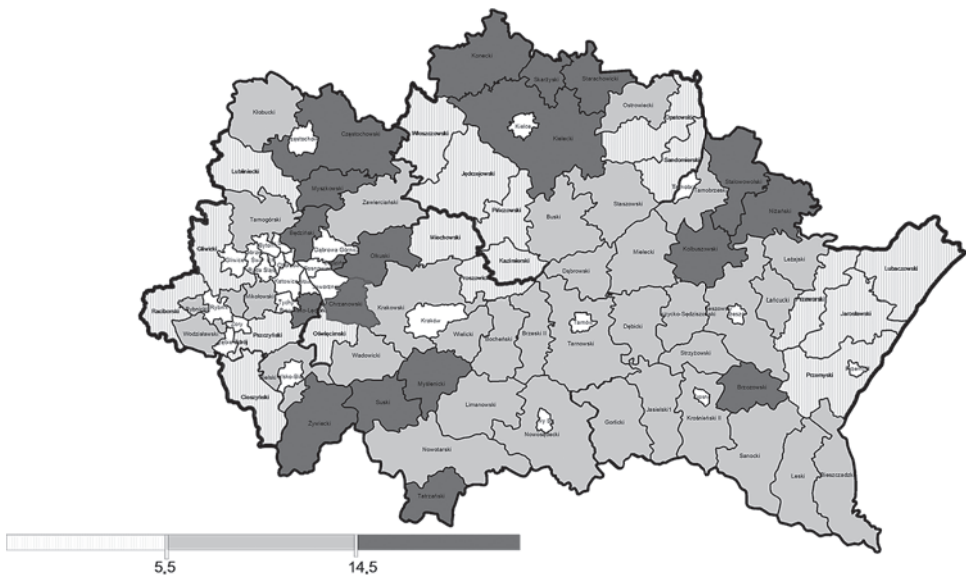
**Ryc. 2.** Wymiary i aspekty procesu dezagraryzacji

Source: Authors' study

Źródło: Opracowanie własne

The process of economic development and heavy industrialisation of Poland after World War II produced a large group of peasant-workers who combined work on the farm with non-agricultural employment. The restructuring of the Polish industry in the 1990s resulted very often in the liquidation of businesses or a significant reduction in the employment levels. This, however, did not apply to people having farms, therefore, the scale of so-called hidden unemployment in rural areas significantly increased. The collapse of enterprises organising the purchase and processing of agricultural products reduced drastically the possibility of selling the products provided by farms, which led to a decline in the profitability of agricultural production. Responding to the negative phenomena occurring in the economy, the farmers scaled down their production. Small

agricultural holdings reduced the production of goods, and with time even the production for self-supply. Farms with a larger surface area and no chance of obtaining revenue from alternative sources attempted to increase the scale of production. The inclusion of Polish farmers in the instruments of the Common Agricultural Policy did not hinder the processes of disgrarisation in Polish rural areas. The surface area of arable land withdrawn from agricultural activities continued to increase. In 2010, only 88.4% of the agricultural lands possessed by private farms in the Małopolska and Pogórze region were maintained in good agricultural condition (bdl.stat.gov.pl). A significant proportion of the land resources was withdrawn from agricultural production (Fig. 3). Undoubtedly, the unfavourable acreage structure of farms and substantial fragmentation of plots contributed to such a situation, making consolidation and concentration of land in economically stronger farms difficult.



**Fig. 3.** Utilised agricultural area characterised by a poor condition of agriculture in land counties (excluding townships) in the Małopolska and Pogórze region in 2010 (%)

**Ryc. 3.** Użytki rolne w złej kulturze rolnej w powiatach ziemskich (z wyjątkiem powiatów grodzkich) regionu Małopolska i Pogórze w 2010 r. (%)

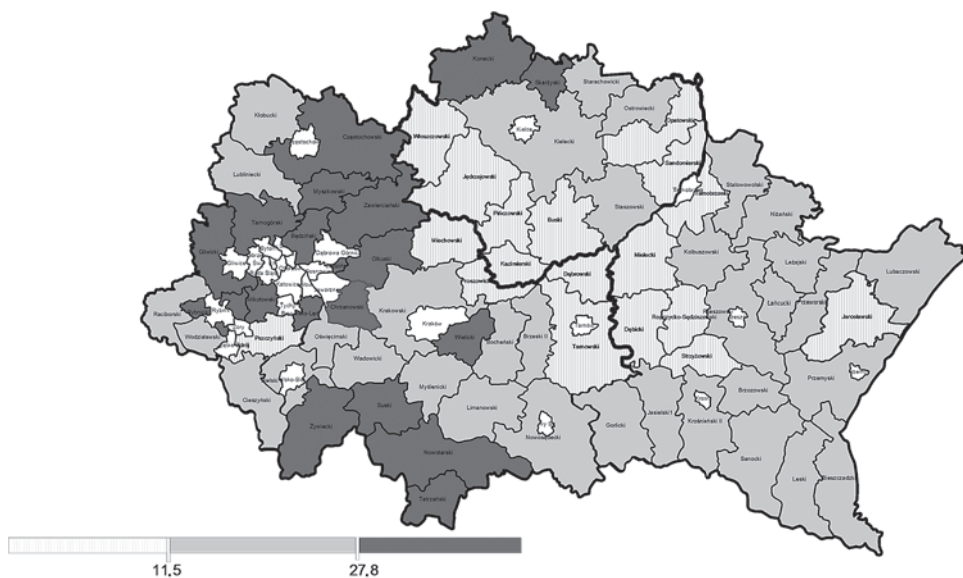
*Source:* Authors' calculations based on the data from the Local Data Bank of the Central Statistical Office (retrieved 11.02.2014 from: [www.stat.gov.pl](http://www.stat.gov.pl))

*Źródło:* Obliczenia własne na podstawie danych z Banku Danych Lokalnych GUS (pobrane 11.02.2014 z: [www.stat.gov.pl](http://www.stat.gov.pl))

The abandonment of land cultivation reached its greatest extent in counties with harsh natural conditions for cultivation and with land of poor quality. The disgrarisation processes were found to be highly advanced in the Skarżyski county, where nearly half of the arable land was in poor culture. High values of the indicator were

also observed in the following counties: Żywiecki (43.0%), Suski (38.4%), Myszkowski (35.5%), and Będziński (33.3%).

The declining role of income from agriculture in the household budgets of farming families can undoubtedly be seen as a sign of the disagrarisation of rural areas. The National Agricultural Census of 2010 demonstrated that 17.2% of farmer households nationwide did not earn revenue from agricultural activities, and the scale of the phenomenon in the Małopolska and Pogórze macroregion was even greater (22.2%). The value of the indicator in question varied considerably across the macroregion (Fig. 4), with the coefficient of variation (CV) being 65.2%.



**Fig. 4.** Proportion of individual farms without incomes from agricultural activities in land counties (excluding townships) in the Małopolska and Pogórze region in 2010 (%)

**Ryc. 4.** Udział gospodarstw indywidualnych bez dochodów z działalności rolniczej w powiatach ziemskich (z wyjątkiem powiatów grodzkich) regionu Małopolska i Pogórze w 2010 r. (%)

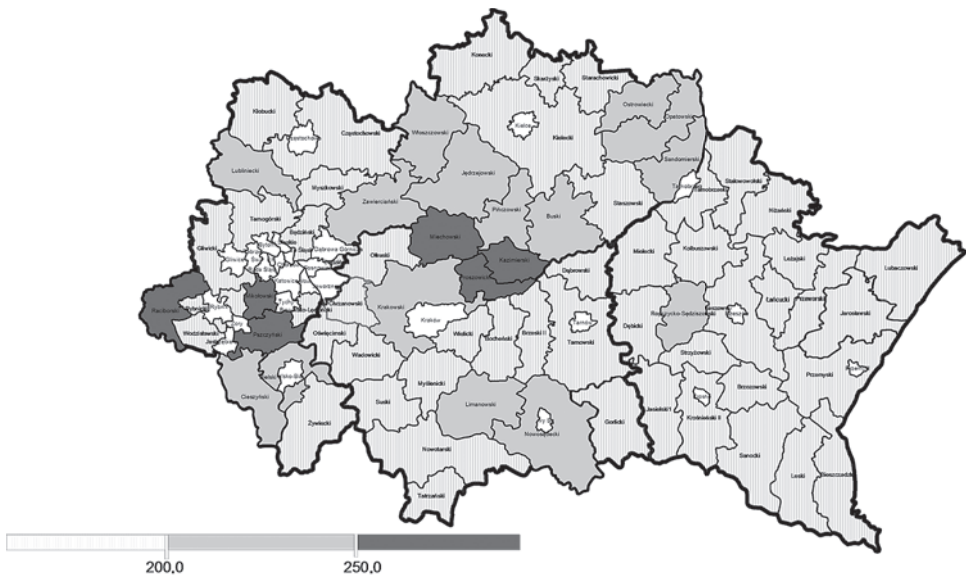
*Source:* Authors' calculations based on the data from the Local Data Bank of the Central Statistical Office (retrieved 11.02.2014 from: [www.stat.gov.pl](http://www.stat.gov.pl))

*Źródło:* Obliczenia własne na podstawie danych z Banku Danych Lokalnych GUS (pobrane 11.02.2014 z: [www.stat.gov.pl](http://www.stat.gov.pl))

Counties with the largest proportion of farms not engaged in agricultural activities were mostly located in the Śląskie Voivodeship, the western and southern part of the Małopolskie Voivodeship, and the northern part of the Świętokrzyskie Voivodeship. The indicator “proportion of farms without income from agricultural activities” was strongly correlated ( $r_{xy} = 0.77$ ) with the indicator “share of arable land in poor culture”, discussed earlier.

Owning a farm from which the farming family derives no income should be regarded as a highly unfavourable phenomenon because it leads to a waste of resources. The proportion of farms without agricultural income was largest in the Skarżyski county (60.6%). More than half of the farms did not generate agricultural income in the Myszkowski (55.2%), Będziński (53.0%), Żywiecki (51.9%), and Mikołowski (50.8%) counties.

The disrargarisation process manifests itself also in the abandonment of labour-intensive activities by farmers. The livestock density gets reduced, the area of labour-intensive crops (e.g. potatoes) gets limited, while the area of wastelands and fallows increases. An analysis of the levels of the potential intensity of agriculture in the rural counties of the Małopolska and Pogórze region made it possible to identify areas with the greatest advancement of the process of extensification of agricultural production (Fig. 5).



**Fig. 5.** Organisational intensity of agriculture in land counties (excluding townships) in the Małopolska and Pogórze region in 2010 (pts)

**Ryc. 5.** Intensywność organizacji rolnictwa w powiatach ziemskich (z wyjątkiem powiatów grodzkich) regionu Małopolska i Pogórze w 2010 r. (pkt)

*Source:* Authors' calculations based on the data from the Local Data Bank of the Central Statistical Office (retrieved 11.02.2014 from: [www.stat.gov.pl](http://www.stat.gov.pl))

*Źródło:* Obliczenia własne na podstawie danych z Banku Danych Lokalnych GUS (pobrane 11.02.2014 z: [www.stat.gov.pl](http://www.stat.gov.pl))

As follows from the calculations, the intensity of agriculture organisation on private farms in most counties of the region is at a very low level; according to the scale proposed by Kopec (1978), such agriculture can be regarded as extensive. In

fifteen counties, agriculture was found to be of low intensity (200–250 pts), and in the next six counties, of medium intensity (250–300 pts). The counties whose scores did not exceed 100 points were: Żywiecki (81.2 pts), Skarżyski (85.5 pts), Leski (92.0 pts), Suski (96.6 pts), and Chrzanowski (98.9 pts).

## Disagrarisation and socio-economic development

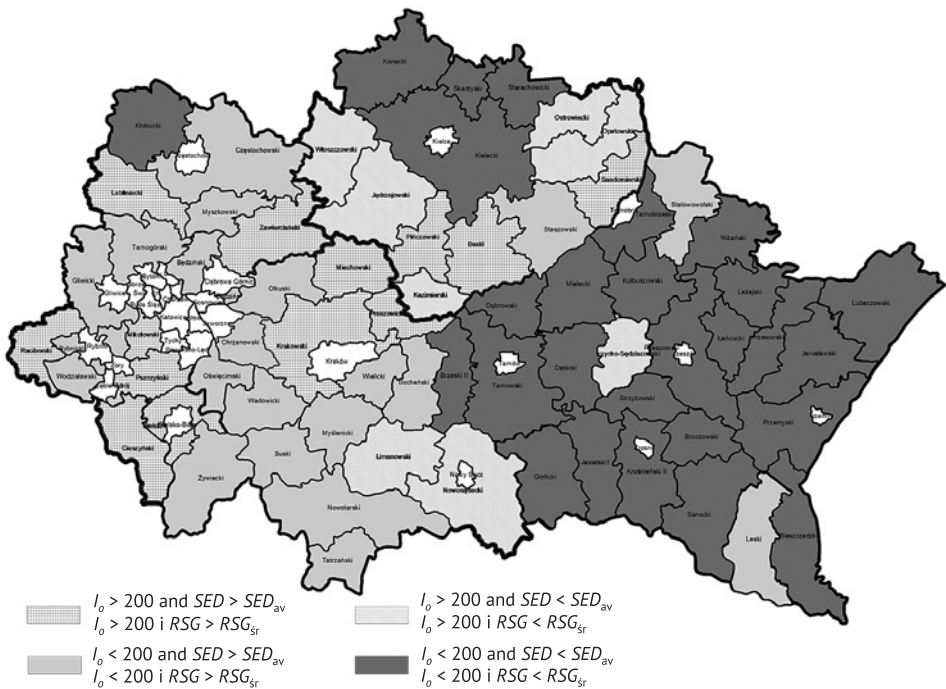
When looking for patterns in disagrarisation processes, it is worthwhile to start from the theory of so-called von Thünen's circles (Thünen and Hall, 1966). The creator of this theory analysed the location at which particular groups of agricultural products are produced in relation to the economic centre (city) constituting both a supply and sales centre, and on this basis formulated some rules about the distribution of agricultural production. In his opinion, the immediate vicinity of the city should be allotted to intensive production requiring a large amount of labour and capital (including horticultural production). Next, the production of so-called basic agricultural products should be located, and farther on, in successive circles, extensive crops and grazing animals, and, finally, forest management (in the most remote circle) will be placed. This theory was used by Sinclair (1967) as a point of departure for creating the so-called reversed theory of von Thünen's circles, suggesting that the intensity of production and the yields per unit area increase with the distance from the centre, one of the factors behind this being the price of land which rises with the decreasing distance to the city.

The contemporary economists, while recognising the theoretical achievements of their predecessors working in the 19th and 20th centuries, emphasise the complexity of the criteria for choosing the right location for each activity, and deciding whether the agricultural activity should be reduced or abandoned. In search for factors which would increase the efficiency of the resource utilisation, the Weberian model based on three basic factors: transport, labour costs, and agglomeration (Weber, 1909) is still taken into account. Along with the extension of transport infrastructure, the lifting of barriers to the flow of the labour force, and the reduction in transport costs, there will be an increase in the significance of other determinants of location, because the costs directly associated with location-related factors represent only a small fraction of the total cost of the production and distribution of goods (Leśniewski, 2012). An increasingly important role in the agricultural production, specifically in the selection of a product line, will be played by macroeconomic factors (such as government policies; availability of markets; prices) and the internal conditions of farms (i.e. resources of production factors; natural conditions). The pressure of urbanisation and the increasing alternative costs of work in agriculture (growing disparity between the remuneration for work in agriculture and that for work outside agriculture) will foster the abandonment of agriculture.

No interrelations were found between the level of socio-economic development and the share of land in poor farming culture possessed by farms ( $r_{xy} = -0.03$ ). This means that the processes of land abandonment, leaving fallow, overgrowing with bushes, or allotting for building purposes occur in areas with a higher and lower level

of development alike. The causes of this phenomenon, however, differ considerably. In areas with high levels of socio-economic development, agriculture moves farther away from the cities, which confirms the theory of Sinclair (1967). Keeping agricultural land by farm owners despite the fact that its cultivation was ceased aims there to incorporate the land into investment resources. By contrast, in areas with low levels of socio-economic development, the abandonment of land is due to a lack of interest in its cultivation not only from the owner, but also from other entities in the immediate vicinity.

Thanks to the high level of socio-economic development of south-eastern Poland, the owners of agricultural land in this subregion have the necessary skills to take a variety of jobs outside agriculture. As a result, the number of farms not engaged in agricultural activity is on the increase. The proportion of farms without income from agricultural activities was found to be weakly correlated ( $r_{xy} = 0.34$ ) with the score for the level of socio-economic development.



**Fig. 6.** Delimitation of the Małopolska and Pogórze region (excluding townships) in terms of the level of social and economic development ( $SED$ ) and the organisational intensity of agriculture ( $I_o$ ) in 2010

**Ryc. 6.** Delimitacja makroregionu Małopolska i Pogórze (z wyjątkiem powiatów grodzkich) ze względu na poziom rozwoju społeczno-gospodarczego ( $RSG$ ) oraz intensywność organizacji rolnictwa ( $I_o$ ) w 2010 r.

Source: Authors' calculations

Źródło: Obliczenia własne



No interrelations were revealed between the intensity of plant production organisation and the level of socio-economic development ( $r_{xy} = 0.04$ ). The former indicator, however, displayed a strong correlation ( $r_{xy} = 0.85$ ) with the usefulness of the agricultural production space. The intensity of livestock production organisation did not depend on natural conditions ( $r_{xy} = 0.01$ ), which can be attributed to the possibility of purchasing fodder outside of the farm, but was weakly correlated with the level of socio-economic development ( $r_{xy} = 0.39$ ).

An analysis of the spatial variation in the levels of agriculture intensity and socio-economic development demonstrated that the Małopolska and Pogórze region is polarised. Rural counties with a low level of socio-economic development and a low potential intensity of agriculture prevail in the eastern part (the Podkarpackie Voivodeship), whereas those with relatively higher level of socio-economic development are located in the western part of the macroregion (the Śląskie Voivodeship and the western counties of the Małopolskie Voivodeship) (Fig. 6).

## Conclusion

The study revealed a moderate variation among rural counties of the Małopolska and Pogórze macroregion in terms of the level of socio-economic development ( $CV = 30.3\%$ ), and the intensity of agriculture organisation ( $CV = 27.7\%$ ). There was, however, a very wide variation in the share of land in poor culture in the structure of arable lands belonging to private farms ( $CV = 83.4\%$ ), and the proportion of farms without income from agricultural activities in the population of private farms ( $CV = 65.2\%$ ). The indicators used to assess the advancement of the process of production and economic disagrarisation exhibited a weak correlation with the level of socio-economic development ( $r_{xy} < 0.4$ ), which allows us to reject the tested hypothesis that “the high socio-economic development of a territorial unit fosters the production and economic disagrarisation of agricultural farms within its boundaries.”

The production and economic disagrarisation of agricultural farms may increase both at high and low levels of socio-economic development, but the roots of the phenomenon will be different. At high levels of socio-economic development, it is easier to obtain income from non-agricultural sources, and there is a greater pressure on reclassifying agricultural land for investment purposes (particularly in the vicinity of regional economic centres), with part of the land being withdrawn from production for speculation. Under such conditions, part of the owners of agricultural land lose interest in agricultural production, which, however, does not necessarily lead to the sale of land. At low levels of socio-economic development, the conditions of fragmented agrarian structure and the limited local demand for agricultural products are conducive to increased migration and extensified agricultural production. Even if farms are not adequately equipped, the weakness of the external environment does not allow their owners to completely abandon farming. As evidenced by, among others, a strong correlation between the intensity of plant production organisation and the usefulness of agricultural production space ( $r_{xy} = 0.85$ ), the natural



conditions that are favourable for agricultural production should be considered as a factor hampering the process of the production and economic disagrarisation of agricultural farms.

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*The study has been financed from the funds of the Faculty of Agriculture and Economics of the University of Agriculture in Krakow as part of task DS 3103.*

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Zaakceptowano do druku – Accepted for print: 28.12.2015

For citation – Do cytowania:

Wojewodzik, T., Satoła, Ł., Tabor, S. (2015). Seeking interrelations between the level of social and economic development and the indicators of the economic and production disagrarisation of farms [W poszukiwaniu wzajemnych zależności między poziomem rozwoju społeczno-gospodarczego a wskaźnikami ekonomiczno-produkcyjnej dezagraryzacji gospodarstw rolnych]. *Problemy Drobnych Gospodarstw Rolnych – Problems of Small Agricultural Holdings*, 4, 103–119. doi: <http://dx.doi.org/10.15576/PDGR/2015.4.103>.