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Factors Affecting Sustainable Development of Agriculture and Rural Areas in the Świętokrzyskie Voivodship

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Abstract

This study aims at identifying factors encouraging sustainable development of agriculture and rural areas in the Świętokrzyskie Voivodship. It is based on the analysis of selected social, demographic, economic and environmental factors which may be useful to identify the present stage of development of rural areas (urban-rural communes and rural communes) in the Świętokrzyskie Voivodship. In order to accomplish their goal the authors used statistical data from the Bank Danych Lokalnych GUS (Local Data Bank from the Central Statistical Office of Poland) for the years 2010 and 2012, and factual data (including reports, strategic materials).

Keywords: sustainable development, agriculture, rural areas

Introduction

Since the 1990s changes in Poland have increasingly encouraged proper development of rural areas for sustainable development and more ecological agriculture. Agricultural structure resembles associated social, economic, environmental and cultural systems, and its multidimensional character is closest in its nature to biological systems. Chances for development and well-targeted production should be based on eco-friendly agriculture (Siekierski 2010, 175–185). Development of rural areas and agriculture requires some support for so-called durable management systems, i.e. based on eco-friendly and integrated agriculture, particularly in environmentally valuable areas. Since the beginning of the 21st century rural areas and agriculture both in Poland as a whole and in the Świętokrzyskie Voivodhip have undergone dynamic changes, recorded in general censuses, analyses of their development, and current strategic documents including the strategy for sustainable development of agriculture and rural areas through 2020. The diagnosed state of development of rural areas and agriculture for the Polish regions comprises a collection of determinants facilitating and limiting their proper development.

1 The method applied in the study

In order to describe the development stage of rural areas and their agriculture the authors used the method of Z. Zioło (1985, 1–11), a so-called composite index, which takes into account real values of features. Apart from presenting differences between units in terms of the parameters in question, it was possible to decide which and to what extent preliminary features influence the value of the index (Runge 2006, 214–223). For measuring current development level of rural areas and the region's agriculture selected social, demographic, economic, environmental and infrastructural features were used.

Socio-demographic features:
- age dependency ratio (the number of persons at the pension age per 100 persons at the pre-working age) in 2012
- employment rate (the employed in total per 100 persons at the working-age) in 2012
- capital of agriculture-related population (percentage of persons with agricultural education in the total number of educated people) in 2010
- unemployment rate (percentage of the unemployed in the total number of persons at the working age) in 2012
- social activity rate (the number of non-governmental organizations per 10,000 inhabitants) in 2012
- IT rate (the number of pupils per 1 computer in primary schools) in 2012

Economic features:
- economic activity of the population (the number of registered businesses per 1,000 persons at the working-age) in 2012
- employment in agriculture (persons employed in agriculture per 100 ha of agricultural lands) in 2010
- employment in services (persons employed in services in the total number of the registered employed) in 2012
- own revenues of communes per 1 inhabitant in 2012
- average size of an agricultural holding in 2010
- use of agricultural land (percentage of agricultural land in the total area of a commune) in 2010

Environmental and infrastructural features:
- percentage of forest land in the total area of a commune in 2012
- livestock density in numbers per 100 ha of agricultural land in 2010
- investment outlays for environmental protection in the period of 2010–2012
- percentage of protected areas in the total area of a commune in 2012
- percentage of users of water-line systems in 2012
- percentage of users of waste-water treatment plants in 2012.
- expenditure from communes' budgets on municipal engineering and environmental protection in 2012.

The composite index is a tool for multi-variable analysis which – based on diversification of features in communes — it makes it possible to arrange them and classify according to their development stage (Brambert 2010). The calculation of the index includes the following steps:
- setting particular entry features
- calculating the composite index for each object
- describing the structure of the composite index

The non-hierarchical clustering of k-means means that the quality of division of objects is optimized. An object belongs to a class whose center of weight is the closest in terms of Euclidean distance. While applying this method it is necessary to specify the number of classes (centers). The last stage provides information on membership of objects to generated centers and the structure of these centers (Kiniorska 2010).

2 Results

Calculation of the composite index in terms of socio-economic indicators led to the emergence of five classes of commune. The first two classes comprise urban-rural gminas with very good — Połaniec (Class I) and good — Opatów, Włoszczowa (Class II) favourable socio-economic conditions. Class III with Sitkówka-Nowiny is characterized by moderate conditions. The next 91 communes belong to class IV with poor conditions. Class V includes two communes — Górno and Łubnice — with the lowest values.

There are certain dependencies connected with the value of the index. For the emergence of the composite index the most important are: the second feature (employment rate), the third (capital of agriculture-related population) and the fifth (social activity rate). The remaining elements are

of equal importance. Classes I–III comprise more favorable socio-demographic conditions. These areas are of industrial and rural nature with well-developed dwelling and service functions. Classes IV–V are composed of communes with unfavorable conditions in selected socio-demographic indicators. They are mostly agricultural areas with poorly-developed industrial and services function. Figure 1 presents spatial distribution of communes with selected socio-demographic conditions. Communes located in the vicinity of main routes have better socio-demographic parameters and are better prepared for increasing economic challenges. They have a lower percentage of old and unemployed persons in comparison to communes from the outskirts, mainly agricultural.

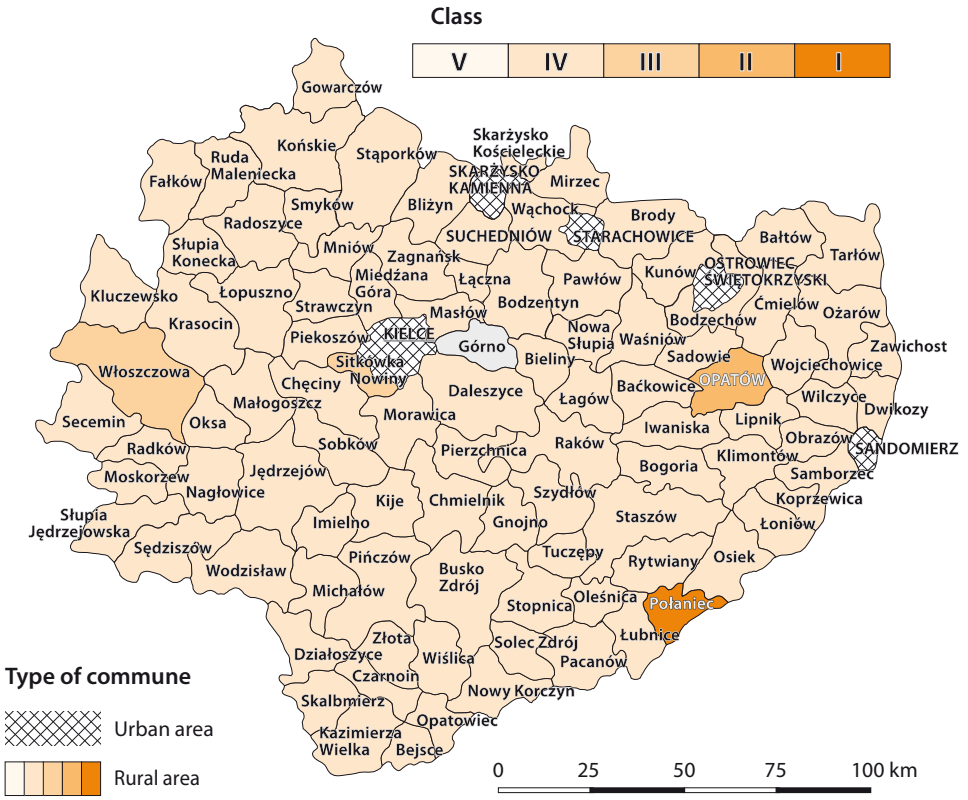

Fig. 1. Spatial diversification of rural areas in the Świętokrzyskie Voivodship according to socio-demographic classes

Further calculations of the composite measure referred to six selected indicators from the economic group. Based on the received values seven classes emerged. Class I includes Busko-Zdrój Commune with very good economic conditions, and in Class II — Końskie Commune. Class III is composed of four urban-rural communes with high economic potential. The next, Class IV is represented by communes with moderate economic conditions — Włoszczowa and Sitkówka-Nowiny. Classes V both have two communes with poor economic conditions — Opotatów and Kazimierza Wielka communes, and VI the Morawica and Ożarów communes. Class VII is the biggest with 85 communes with the poorest economic conditions. In the formation of the composite index the most important features are: the third (employment in services) and the first (economic activity of the population).

The analysis of the composite index of economic conditions showed certain dependencies which come from the functional character of communes as well as their location. Communes located in the vicinity of towns and cities with local authorities offices (county authorities) have better economic conditions (fig. 2).

Classification of communes according to selected environmental and infrastructural features defined five classes of the composite index distribution. Class I was composed of Połaniec Commune with a very good environmental and infrastructural condition. Class II included Sitkówka-Nowiny Commune, and Class III Ożarów Commune with a good, positive environmental and

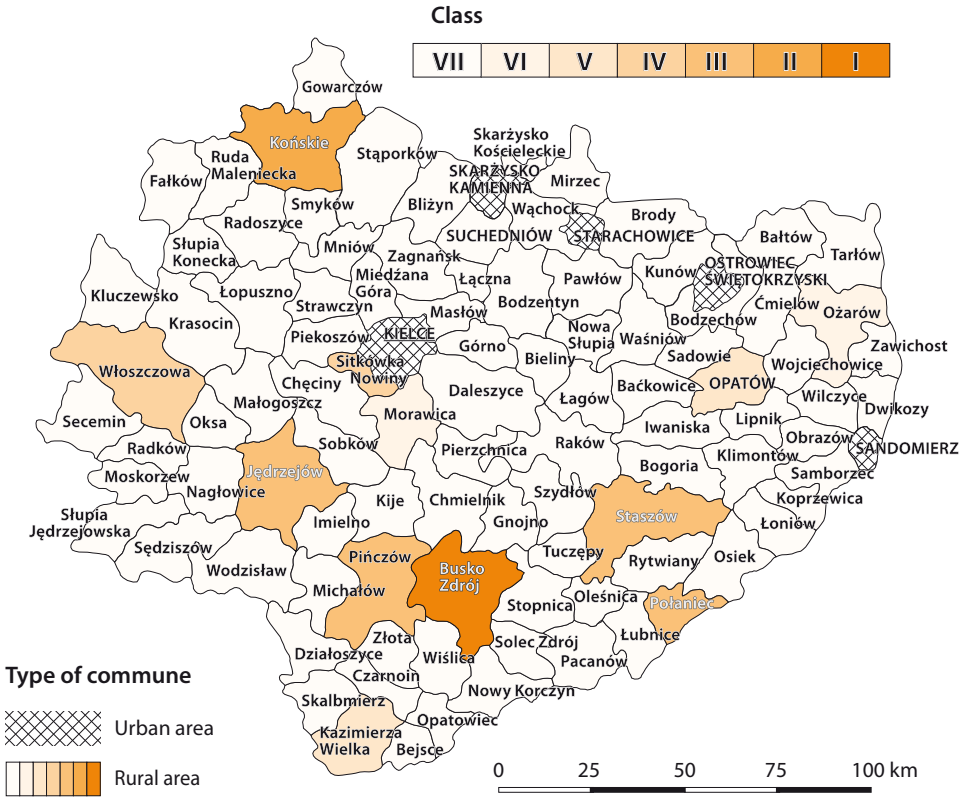

Fig. 2. Spatial diversification of rural areas in the Świętokrzyskie Voivodship according to classes of economic conditions

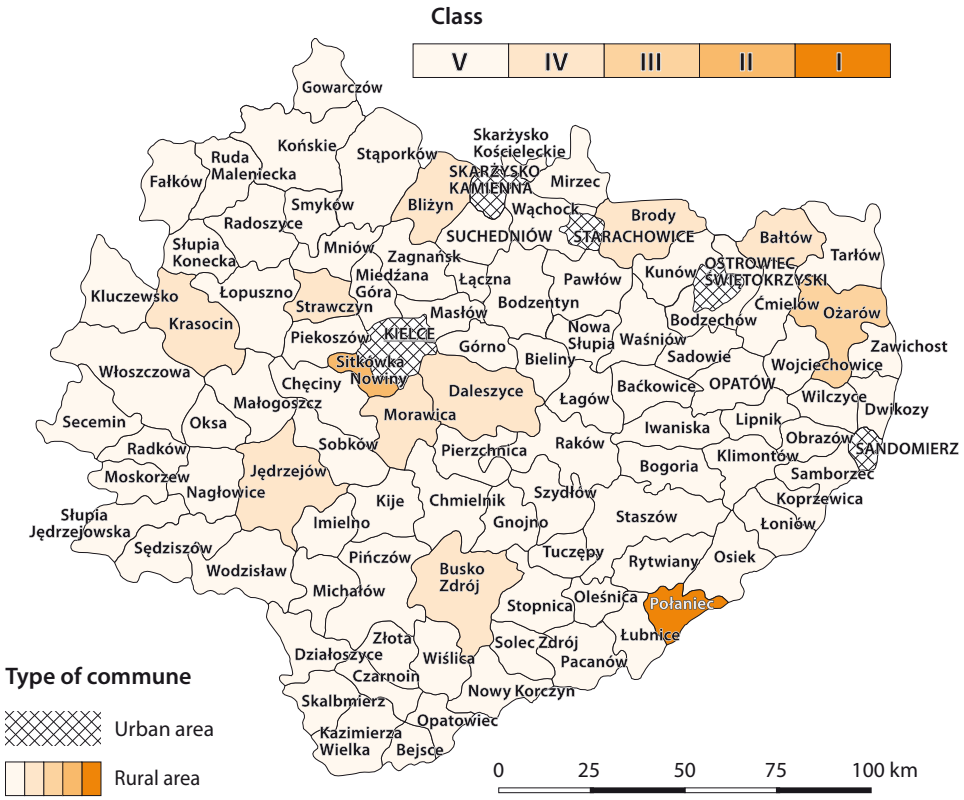

Fig. 3. Spatial diversification of rural areas in the Świętokrzyskie Voivodship according to classes of environmental and infrastructural conditions

infrastructural condition. Class IV comprises 9 communes with moderate conditions, and the remaining 86 communes belong to Class V with poor conditions. The latter is mainly composed of areas with underinvested environmental infrastructure. The value of the composite measure is mainly affected by three features: the third (investment outlays for environmental protection in the period of 2010–2012.), the sixth (percentage of users of waste-water treatment plants), and the seventh (expenditure from communes' budgets on municipal engineering and environmental protection). Figure 3 shows spatial diversification of gminas according to classes of environmental and infrastructural conditions.

3 Conclusions

Based on the analysis of identified factors affecting sustainable development of the region and the available literature on the subject, the conclusion is that there are numerous barriers limiting the development of rural areas and agriculture of the Świętokrzyskie Voivodship on many fields (Wrońska-Kiczor 2013, 52–54). Negative social phenomena include: limited non-agricultural employment, hidden unemployment, poor education of persons managing agricultural holdings (farms), poverty, low social activity of rural population, insufficient number of health care units, cultural facilities, kindergartens, nurseries, and old-pensioners homes. Economic barriers include: underused agrarian structure of agricultural holdings, decreasing areas of agricultural lands, agricultural excessive employment, an a high percentage of extensive agriculture. Despite an improved but still insufficient quality of life, environmental and infrastructural barriers include underdevelopment of technical and environmental infrastructure.

The analysis of the strategies for sustainable development of agriculture and rural areas of the region through 2020 shows the important role of rural areas.[1] Detailed goals of the strategies focus on strengthening their competitiveness and importance. It is necessary to introduce actions supporting non-economic values of these areas, develop their tourist infrastructure (accommodations, restaurants and catering, upgraded sport and recreation facilities, water sports and cycling facilities), improve the quality of tourist services, and establish local tourist businesses. The coming years should bring changes which will lower the percentage of the labor force employed in agriculture, raise agricultural production efficiency and its competitiveness, improve agrarian structure, and the importance of agriculture itself in shaping future functional structures of rural areas which will weaken in exchange for their multifunctional and sustainable development. The pace and efficiency of these changes will depend mainly on regional policies based on strategic programs and financial support from the Polish government. Eco-friendly agriculture requires a new or modernized and upgraded food processing base and distribution network. Eco-friendly food production in line with sustainable development is a proper solution for the small and economically weak agricultural holdings of the region with a considerable labor force.

Summary

This study aims at identifying factors encouraging sustainable development of agriculture and the rural areas of the Świętokrzyskie Voivodship. It is based on the analysis of selected social, demographic, economic and environmental factors which may be useful to identify the present stage of development of rural areas (urban-rural communes and rural communes) in the Świętokrzyskie Voivodhip. The analysis showed that agriculture and rural areas of the Świętokrzyskie Voivodship have to face barriers that slow their growth in many aspects. Negative phenomena and demographic, social, economic, environmental and infrastructural processes will still affect sustainable development. However, the activity of local authorities, national policies and Polish citizens may considerably improve the situation.

1. See: Szanse i zagrożenia oraz potencjalne kierunki rozwoju obszarów wiejskich w Polsce w ujęciu regionalnym. KSOW-26–12/ZP-MS/2012. Raport podsumowujący. Warszawa 2012, pages 222–238, available at http://ksow.pl/fileadmin/user_upload/ksow.pl/pliki/ANALIZY_ekspertyzy/Raport_FINAL%20Szanse%20i%20zagrozenia%207_01.pdf.

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