

## RESOURCES AND USE OF AGRICULTURAL LAND IN POLISH CITIES ACCORDING TO CHOSEN THEORIES OF LOCATION OF AGRICULTURAL PRODUCTION

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**Abstract.** This article is written to verify the hypothesis which states that the share of land used by farms within the surface of cities and their scope of production usage are determined by the mechanism of land rents. It can be noted that in big cities (above 500 thousands of inhabitants) and in cities with a concentration of companies from non-agricultural sector, the share of agricultural lands is above 8.5 and 5.1 percentage points lower than in the researched city population. It should also be mentioned that in these units above 35% of agricultural lands are not used agriculturally, whereas in Polish cities, on average, this proportion amounts up to about 28%. Upmost importance to the use of lands in cities is also attached to speculative actions and public intervention, which are prevalent in big cities and cities with a large number of companies from non-agricultural sectors.

**Key words:** agricultural land, urban agriculture, location of agricultural production, economic rent

### INTRODUCTION

The last two hundred years have been a period of a dynamic technical and civilization progress as well as socio-economic changes. Industrial growth followed by the growth of the services sector have considerably contributed to an increased importance of towns and cities and gave a start to the urbanization process. As of late 20<sup>th</sup> century or earlier, dynamic urbanization processes as well as a gradual increase in the size of urban areas have been noted in Poland. The main constituent parts of these process are: natural growth, migration from villages to towns and changes in administrative borders [Bagińska and Szmytkie 2005]. This has been mainly linked to strong industrialization processes in 1960–1985, when almost 90% of big cities with the population over 100 thousand increased in size. Szymańska et al. [2006] note a strong correlation between

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the scale of growth in the area and the size of cities depicted by their population. Both at the time as well as at present, frequently the size of a city would grow as a result of swallowing adjacent towns which would not necessarily have compact development and high population density, hence areas of an agricultural profile are found within city administrative limits [Bański 2008]. As a result of an ongoing urbanization, an increasingly large population would become an urban population and an increase in the size of the urban center would be noted, whereas rural land (landscape) would have been transformed into urban land (landscape). The lifestyle of the population would change as well.

Some authors [Wagner 2005, Tarkowski 2007, Giecwicz 2010, Krzyk et al. 2013] claim that agricultural land is nowadays perceived as a territorial reserve for other more profitable actions. It also seems that the share and ways of agricultural land usage are determined by the mechanism of land rent. The approved hypothesis states that increase in both the size of and the intensity of occurrence of business entities from non-agricultural sector in urban areas is concomitant with decrease in both the share of agricultural lands in the surface of these areas and the percentage of lands used productively. This phenomenon is the result of the mechanism of land rent (agriculture, which is characterized by a relatively small differential ground rent, is displaced from cities).

## **RESOURCES, METHODOLOGY AND PURPOSE OF RESEARCH**

The objective scope of analysis is aimed at diversity in resources and ways of agricultural lands usage, which are owned by farms situated in administrative borders of 306 urban districts. The main source of information is data available in the Local Data Bank of the Central Statistical Office, data available from the Agency for Restructuring and Modernisation of Agriculture (ARMA) as well as literature references. A statistical study was carried out with mainly 2010 data being used and data related to the sample of farms studied is presented by location of the seat of a relevant entity. The use of data from the Agricultural Census (2010 AC) poses certain interpretation problems as specifically in terms of farms which are different than individual farms, instances are noted where the seat of the farm is located in a town or a city whereas related agricultural land is located outside the town or the city. Despite this, according to the 2010 AC methodology, agricultural land which belongs to such farm is considered urban land. Nonetheless, relatively insignificant discrepancies were noted in the process of analyzing a large number of towns and cities and establishing average results.

The objective of the study is to assess agricultural land resources as well as the manner in which they are used in municipalities, while taking into account the size of a town or a city as well as the number of economic entities which operate in the services sector and industry sectors. Thus posited, the objective of the study was then facilitated by identifying a number of research tasks. The first one consisted in establishing a classification of towns and cities, the second one – in presenting a discussion of key theories related to the location of agricultural output, and the third one – in assessing the impact of the size of a town or a city as well as the number of non-agricultural enterprises on agricultural land management. The study employs a range of research methods including generic methods (deduction, reductio reasoning, comparisons and analogies), the descriptive method and quantitative methods (analysis of the dynamics and mix, correlation coefficient).

The purpose of the study required that a classification of towns and cities be proposed and a number of variables be employed. The variables were selected based on subject-matter prerequisites. The first and an essential criterion of the classification of towns and cities is the size as depicted by their population [Runge 2012]. This study groups towns and cities into four categories, i.e. small town (with the population up to 20 thousand), medium small (20–50 thousand), medium large (50–100 thousand), large (over 100 thousand) and very large (with the population over 500 thousand). Due to specific characteristics of Katowice and Gdańsk, i.e. the fact that they are directly adjacent to other municipalities, it was decided that these centers will be considered cohesive urban entities. This approach is justified as both the Tricity (Gdańsk, Gdynia and Sopot) as well as Katowice Urban Area (Katowice, Bytom, Chorzów, Dąbrowa Górnicza, Gliwice, Jaworzno, Mysłowice, Piekary Śląskie, Ruda Śląska, Siemianowice Śląskie, Sosnowiec, Świętochłowice, Tychy, Zabrze) are geographically and functionally cohesive compact urban centers.

Another classification of towns and cities used is concentration of entities registered in the National Register of Economic Units (REGON) in industry sectors as well as the services sector converted into 1 km<sup>2</sup> of urban areas as the delimitation criterion. A detailed rationale for an adoption of this solution is presented in the next section of the study. After concentration indices were calculated for economic entities per area unit ( $C_{e. entities}$ ), towns and cities were divided into four groups, and an arithmetic mean ( $A$ ) and standard deviation ( $SD$ ) were employed:

- $C_{e. entities} \geq A + SD$  – towns and cities with the highest concentration of REGON entities;
- $C_{e. entities} \in [A, A + SD)$  – towns and cities with a medium concentration of REGON entities;
- $C_{e. entities} \in [A - SD, A)$  – towns and cities with a low concentration of REGON entities;
- $C_{e. entities} \leq A - SD$  – towns and cities with the lowest concentration of REGON entities.

As a result of this categorization process, towns and cities characterized by the highest concentration of economic entities registered in the REGON system revealed 64 towns and cities, and the subsequent categories revealed 77, 76 and 77 municipalities respectively.

## **LOCATION OF AGRICULTURAL PRODUCTION IN TOWNS AND CITIES: THEORETICAL STUDY**

Studies related to the location of agricultural production initially followed regional geography, and they acquired economic features when D. Ricardo proposed the economic rent theory [Grabowska 1986]. Mainstream economic literature mentions land rent issues in the works of A. Smith and T. Malthus, who identified four types of rent: based on differences in soil fertility, its location, additional capital outlays, and a generic rent referred to as absolute rent [Czyżewski 2013]. Other schools of economy also described sources and mechanisms of economic rent – to varying extents. Due to the fact that this

topic has been discussed and described in detail in recent years in many academic studies, especially by Czyżewski and Matuszczak [2010], Marks-Bielska [2010], or Szymańska [2012], or Czyżewski [2013], this study presents only an outline of the rent issue due to the location of land with special considerations for specific features of cities.

While referring to the issue of agricultural production location, the classical theory formulated by J.H. Thünen should be mentioned at first. Thünen noted that the manner in which space is used is determined by rent, i.e. income from agricultural output less production costs [Kurz 2011]. Kurz [2011] searched for links between the production profile of a farm and the distance from the market. Thünen proved that the heaviest, the least durable – and by the same the most profitable – agricultural products should be produced closest to the market while less labor-intensive and less profitable products should be produced relatively further from the market [Schulze-Steinmann and Holm-Muller 2010]. As a result, he came up with the idea of spheres (circles) for various types of agriculture (which were symmetrical to the market). The significance of this theory has now diminished when applied to agricultural production and it was as early as in 1967 that R. Sinclair presented his thesis about reversing Thünen spheres [Wigier 2012]. The fact that this classical theory of location is no longer up-to-date was caused by the following factors: the growth of transportation, refrigerator technology, processing industry etc. Nonetheless, the basic notion that the location of a specific activity depends on the economic rent it generates is still up-to-date and may be used when explaining the manner in which farmland is used in towns and cities. A. Marshall decided that the land rent theory for developed land is essentially the same as for agricultural rent, while the price of developed land equals the price of agricultural land plus discounted location benefits [Luchter 2010]. Hence, the production of goods for which benefits/profitability is sufficiently high are located the closest to the market (as these goods can ensure the highest differential rent). Hence, relevant entities compete for land which allows them to produce the best utility (profits/income). For a relevant location, they are prepared to pay a price which is related to expected profits which can be realized in that location. This refers to both enterprises which due to a good location (developed infrastructure, presence of prospective customers) will earn more profits as well as to other entities, e.g. individuals who – when choosing residence (a house or a flat) – will maximize the level of utility earned on the consumption of housing services [Tarkowski 2007]. Land rent (urban rent) and its derivative, i.e. the price of land, represent discounted benefits which can be acquired by the user in a given urban location.

Alonso adapted the Thünen model for the requirements of spatial studies of metropolitan area development and the model was subsequently extended to the so-called general format (Generalised Thünen Models) [Lorens and Martyniuk-Pęczek 2010]. While studying four types of economic activity (Fig. 1), it should be noted that they are located at different distances from the urban center. Services and commerce where access to the client is the priority are located in an urban center. This is so as this type of activity, especially higher-end services, generates high income which makes it possible to pay high rates for the area used (e.g. rental).

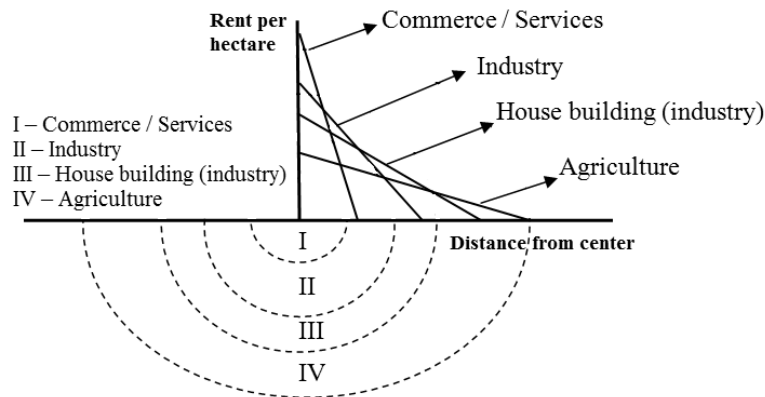


Fig. 1. Land rent (urban rent) versus land location for land of various designations  
Source: Author's own study based on Lorens and Martyniuk-Pęczek [2010].

Production activity is located further from the center. This is because enterprises which belong to the industry sectors as well as large-floor commerce operators have more requirements for necessary space and by the same their profitability per unit of area will be lower than that for services. Residential housing is located even further from the center as it generates lower income for investors than that earned by other sectors indicated [Tarkowski 2007]. Residential housing is certainly located everywhere around a town or a city, however, prices per 1 m<sup>2</sup> in the center are very high so that the investor may cover the high costs of land purchased. A similar correlation relates to locations of other types of activity. According to this model, agricultural areas are located definitely the furthest from the center as their profitability is lower than that noted in other sectors of the economy.

Considerations about a selection of an optimum location for production were also analyzed by Weber, who decided that as far as industrial enterprises are concerned, distance from the market and costs of transportation are key location factors [Lewandowska-Gwarda 2013]. On the other hand, Lösch [1961] based his theory on profit maximization as the key criterion for an optimum location. According to his concept, producers and consumers, resources and products, distribution and consumption create a cohesive market-regulated system. E.M. Hoover, while agreeing with key assumptions of both Thünen's as well as Lösch's concept, notes that zones which demonstrate rational distribution of various types of activity around towns and cities may become deformed as a result of an impact from various factors, such as changes in production technology, changes in the size of the market, planning requirements [Grabowska 1986], and presently – planning conditions and speculative actions [Sroka 2014].

To recapitulate, it should be stressed that the majority of theories devoted to production location point to the importance of distance from the market, i.e. principally, distance from the city center. Differences resulting from the location of specific types of activity relative to metropolitan areas are – in most part – derivatives of their utility/profitability. Interrelationships presented are mainly based on principles of neoclassical economics and public intervention has not been taken into consideration here. In reality, the pattern

of the economic rent is disturbed especially by administrative decisions or by local plans of spatial development approvals; hence the share of agricultural land and other land in towns and cities will not always correspond to patterns and regularities presented.

## DIVERSIFICATION OF AGRICULTURAL LAND RESOURCES IN POLISH CITIES: EMPIRICAL STUDY

Land management in towns and cities is linked to the requirement for decision-making as to the manner in which land is to be used, the process being the forum of a unique game conducted in the macro- as well as the micro-scale. The game involves confrontation of principally opposing interests conveyed by particular participants who control land [Lorens and Martyniuk-Pęczek 2010]. From the spatial planning perspective as well as the economic perspective, the mix of relevant urban land designations is very important. It will vary depending on the size of a town or a city, on the degree of growth of an urban and regional economy as well as on the level of public intervention.

Taking into account the spatial aspect, agricultural land is definitely the element of cities and towns which is the most important and is frequently marginalized. Sroka [2013] stresses that on the average, there are twice as many urban agricultural areas per citizen in Poland than developed and urbanized areas. While assessing the share and importance of agricultural land in total areas of municipalities, it should be noted that Poland is characterized by a very high diversification in this respect. According to data sourced from the Agricultural Census (2010), the percentage of agricultural land which is owned by farms in urban areas ranges between a few percent (e.g. in Chorzów and Katowice municipalities) and significantly over 75% (e.g. in Przeworsk, Racibórz and other municipalities). On the average, the sample of municipalities studied indicates the percentage of agricultural land at 35.6% of total urban areas (Table 1), whereas definitely the lowest percentage of agricultural land is located in cities with the population of over 500 thousand

Table 1. Selected features of agricultural land in municipalities by town/city size

Town/City size by population (thousand inhabitants)	Number of towns/cities studied	Population density (person·km <sup>-2</sup> )	Percentage of farms in total town/city area (%)	Agricultural land (ar·person <sup>-1</sup> )	Number of RE-GON entities from industry and services sectors (km <sup>-2</sup> )
Below 20	119	466	35.8	7.7	50.5
20–50	99	1,080	41.8	3.9	119.4
50–100	43	1,341	41.4	3.1	141.6
100–500	26	1,626	33.6	2.1	198.1
Above 500	7	2,194	26.9	1.2	334.4
Total <sup>a</sup> municipalities	294	1,344	35.6	2.6	171.0

<sup>a</sup>The study was conducted on the sample of 306 municipalities; however, the total number of towns/cities is lower due to the fact that Katowice Urban Area, made up of 14 towns and cities, as well as the Tricity are presented as single centers.

Source: Author's own study based on Central Statistical Office data.

(approximately 26.9%), and the highest percentage of agricultural land is located in local government units with the population ranging between 20 and 50 thousand (41.8%).

A relatively low percentage of agricultural land in the smallest towns (35.8%), which are usually surrounded by rural areas and – as it would seem – are predestined for the development of urban and suburban agriculture, results from their relatively small areas, which brings about fierce competition for land. Small towns are characterized by typical low-rise (single-family) housing which occupies relatively large areas [Wójtowicz-Wróbel 2008]. Hence, it may be suggested that where demand for land to be used by the services and industry sectors is low (average number of entities registered in REGON per 1 km<sup>2</sup> is as low as 50.5 while this average for municipalities stands at 171 entities 1 km<sup>2</sup>), land is used mainly for housing purposes and transportation facilities. A low economic rent on the cultivation of agricultural land, especially where relative land deficits are noted, makes the percentage of agricultural land relatively small. Nonetheless, despite a relatively small percentage of agricultural land in urban areas, as high as 7.7 ar of agricultural land are noted per citizen, the figure being three times higher than a corresponding average in the sample of towns and cities studied.

Studies of agricultural land resources in towns larger than those with the population of 20 thousand indicate that as population density increases, the percentage of agricultural land which belongs to farms in the total area of towns and cities decreases. In municipalities with the population between 20 and 50 thousand, agricultural land represents 41.8% of their total area, whereas in local government units with the population over 500 thousand this indicator is lower by almost 15 percentage points. Moreover, it is noted that as the percentage of agricultural land shrinks, the number of entities registered in REGON per 1 km<sup>2</sup> of urban areas increases. Hence, it should be noted that towns characterized by a relatively high concentration of entities and high population density to a larger extent use land to facilitate non-agricultural economic activity, residential housing and transportation infrastructure. This dependency is also noted in instances where towns are depicted by the concentration of REGON-registered entities (Table 2). It turns out that in local government units where over 240 economic entities per square kilometer are noted, the percentage of agricultural land in urban areas is lower by 12 percentage points than in towns and cities where the number of economic entities ranges between 40 and 139. Municipalities characterized by the number of REGON-registered entities

Table 2. Selected features of agricultural land resources in municipalities by concentration of economic entities

Town/City size (economic entity·km <sup>-2</sup> )	Number of towns and cities studied	Population density (person·km <sup>-2</sup> )	Percentage of agricultural land in total urban areas (%)	Area of agri- cultural land (ar·person <sup>-1</sup> )	Number of RE- GON entities in industry and servi- ces sectors (km <sup>-2</sup> )
Below 40	77	227	24.4	10.7	23.5
40–139	76	864	42.4	4.9	89.1
139–240	77	1,568	41.4	2.6	184.6
Above 240	64	2,172	30.4	1.4	309.2
Total municipalities	294	1,344	35.6	2.6	171.0

Source: Author's own study based on 2010 Agricultural Census data.

below 40 per 1 km<sup>2</sup> are an exception to this rule. As indicated earlier, this group consists mainly of small towns.

Relatively small differences in the percentage of “urban agricultural land” across municipalities which noted average concentration of economic non-agricultural entities (40 to 139 entities per 1 km<sup>2</sup>) and high concentration of entities (139 to 240 entities per 1 km<sup>2</sup>) partly result from an overall change in urban areas. In the category of local government units studied, it is the municipalities characterized by significant concentrations of economic entities which have noted approximately 2.5% of an increase in the total area in the last 10 years, whereas other categories have noted an increase of 0.7% in the corresponding period. Growth of towns and cities involved annexation of adjacent locations which were mainly rural and contributed to an increase in the share of land belonging to farms in the total areas of towns and cities. These changes could thus contribute to an increase in the share of agricultural land belonging to farms in the total areas of towns and cities even by 2 percentage points. To a certain extent, this explains a relatively large share of agricultural land in towns and cities where also a high concentration of economic entities is noted.

Based on figures produced, it may be concluded that the share of agricultural land (belonging to farms) is largely determined by their size as well as the number of economic entities per 1 km<sup>2</sup>. Municipalities which are the biggest centers in relevant regions, particularly provincial capitals, demonstrate regional growth poles and it is there that a large number of service sector companies (including commerce), industry sector companies (including construction) as well as public administration units are located. Moreover, a very high population density (over 2,200 people per 1 km<sup>2</sup>) is a trigger to use some land for the construction of residential housing. The agricultural sector in the largest local government units is pushed outside city limits and occupies relatively small areas. This dependency is certainly weakened by a range of non-economic factors including public intervention, historical spatial landscaping of towns and cities, etc.

Taking into consideration the concept of balanced growth of towns and cities, it seems that particular attention should be paid to the mix of agricultural land, and predominantly, issues of the share of land excluded from agricultural production. The latter is not beneficial from the economic, social and environmental point of view, and relevant studies indicate that a very high percentage of agricultural land recorded in towns (over 28%) is made up of land which is not cultivated, i.e. land which is not maintained in a good farming culture, fallow land, and land excluded from production (Table 3). As a comparison, the share of this type of land in rural areas is approximately 8.5% of the total area of agricultural land. The evidence of marginalizing agricultural production in urban areas is a small percentage of agricultural land which is cultivated, i.e. approximately 49% (against 68% for rural areas in Poland) as well as low absorption of direct subsidies. In 2012, these subsidies were granted up to 40% of agricultural land in municipalities whereas on the average, they are sourced for approximately 92% of agricultural land in Poland. Towns and cities studied are characterized by a very high degree of diversification in indicators discussed. A significantly smaller share of cultivated land in the total of agricultural land as well as in areas subject to receiving direct subsidies was noted in cities with the population between 100 and 500 thousand, i.e. 44.4 and 31.6% respectively. Towns with the



Table 3. Use of agricultural land and selected features of the mix of farms in municipalities by population size

Town/City size by population (thousand inhabitants)	Percentage of agricultural land which won direct subsidies (%)	Percentage of land which is sowed in total area of agricultural land (%)	Percentage of agricultural land excluded from production in total area of agricultural land (%)	Percentage of farms not involved in agricultural activity (%)
Below 20	53.9	52.9	20.1	33
20–50	39.3	47.5	26.4	36.3
50–100	40.8	56.4	24	37.6
100–500	29.9	42.2	35.6	43.4
Above 500	35.7	47.5	37.1	44.2
Total municipalities	40.3	49.2	28.2	38.2

Source: Author's own study based on 2010 Agricultural Census data.

population below 20 thousand note the percentage of land where direct subsidies were sought at 53.9%, hence much higher than in other categories.

When assessing diversification in the share of agricultural land excluded from agricultural production as well as the percentage of farms which are not involved in agricultural activity in towns and cities of varying sizes, it should be noted that indicators get higher as the size of towns and cities increases. The bigger the town or city, the higher the indicator, a fact which points to an ongoing disagrarization. Big cities offer more jobs outside agriculture while the price of agricultural land is higher there, which translates into withdrawing labor and land resources from agricultural activity. It is also the case that farm owners discontinue agricultural activity and await the right moment when they can sell off land or pass them on to the heirs. If the spatial development plan allows it, they change the designation of land from agricultural land to construction land. This process may have intensified after amendments to the Farm and Woodland Conservation Act became effective, by force of which land located within urban administrative limits is excluded from conservation.

A relatively large share of agricultural land used which is being sowed as well as land which receives direct subsidies in the largest cities (with the population over 500 thousand) results from the fact that relatively large arable areas controlled by bigger-size farms are noted there. In towns and cities, the share of farms with the areas over 20 ha is the largest and stands at 2.5% while the average corresponding figure for other towns and cities is 1.6%.

Studies conducted show that the differences in how urban agricultural land is used are even more visible where the number of REGON-registered economic entities per 1 km<sup>2</sup> of municipal areas is considered. A moderately strong negative correlation may be noted between the percentage of land receiving direct subsidies and the number of REGON-registered economic entities per 1 km<sup>2</sup> of towns and cities analyzed. The correlation coefficient is -0.38 and is important from the statistical point of view. This means that as the importance of non-agricultural features depicted by the concentration of economic entities grows, the percentage of farms which receive direct subsidies shrinks. In

current economic conditions, including a very big significance of direct subsidies to the income of farms as well as relatively low criteria needed in order to securing the subsidies, this means that in reality, agricultural land is not maintained in good agricultural culture and the landowner has discontinued agricultural production. This is confirmed by yet another correlation. As the concentration of economic entities in towns and cities grows, the pace at which land is excluded from agricultural production and the share of farms which are not involved in agricultural production increase (Table 4). In towns and cities where which disclose the lowest concentration of economic entities, the share of agricultural land excluded from production is around 21%, whereas in local government units, where very high concentrations of economic entities are noted (240 entities per 1 km<sup>2</sup>) almost as high as 35% of agricultural land is no longer cultivated.

Table 4. Use of agricultural land and selected features of the mix of farms in municipalities by the concentration of REGON-registered economic entities

Town/City size (economic entity · km <sup>-2</sup> )	Share of agricultural land which receives direct subsidies (%)	Share of land which is sowed in total agricultural land area (%)	Share of agricultural land excluded from production in total agricultural land area (%)	Percentage of farms not involved in agricultural activity (%)
Below 40	60.9	43.4	20.9	35.5
40–139	46.9	52.2	24.8	35
139–240	34.4	50.1	29	36.5
Above 240	29.4	46.7	34.5	47.1
Total municipalities	40.3	49.2	28.2	38.2

Source: Author's own study based on data from the Main Statistical Office [2010] and ARMA [2012].

In bigger cities, and predominantly in municipalities which note high concentrations of economic entities (hence, potentially high demand for land), a high percentage of land is not cultivated. Landowners are not interested in cultivating the land nor selling it as they speculate that an alternative use of money obtained from its sales or lease will generate less income than an increase in the value of land due to its attractive location. The pattern of land use in towns and cities is strongly determined by the so-called capital rent which results from an ownership title to the land in an attractive location [Musiał and Wojewodzic 2013] as well as a planning rent which results from changes in the land designations approved by the local plan of spatial development. Both types of rent are deferred in time and their impact is stronger when anticipated benefits are bigger. This is even more important as costs incurred due to land ownership are insignificant in Poland (rates of farm tax are low if the quality of agricultural soil is poor), and land ownership may give its owners some entitlements, including insurance benefits. Thus, the economic and legal environment encourages the process of setting aside agricultural land and an intensified speculative activity as far as land management. This refers particularly to very big cities and cities and towns which note high concentrations of non-agricultural entities.

## CONCLUSIONS

Agricultural land in towns and cities is a very important constituent of half-open spaces and an important feature of the natural world. In Poland, the average share of agricultural land controlled by farms is over 35% of municipalities' areas. However, the study conducted confirms a high diversification in the share of agricultural land in municipal areas as well as in the manner in which they are used. The use of municipal areas in very big cities where the share of agricultural areas is approximately 27% in total is very different from that noted in medium-size towns (with the population of 20–50 thousand) where this percentage is higher by 15 percentage points on the average. The diversification is also a derivative of the condition and mix of the economy depicted in this study by the number of enterprises which operate in the services and industry sectors per unit of area. Findings of empirical studies confirm the concept of pushing out land uses which are economically weak (i.e. agricultural use) by stronger ones. New forms of economic activity on the rise, growth of the services sector and commerce followed by growth of residential housing construction and transportation systems result in the percentage of agricultural land noted in towns characterized by a large concentration of enterprises, which is on the average lower by 5 percentage points than in the population studied.

The study conducted also indicates that the size of the town or a city as well as the number of non-agricultural entities per unit of an area have created significant differentiation in the mix of agricultural land use. The biggest cities note that the share of land which is not cultivated is higher by over 17 percentage points than in the smallest towns. The former also saw the highest percentage of farms which are not involved in agricultural activity. Speculative activity of landowners of agricultural land is of significance in an urban market of agricultural land as far as future property prices. The bigger the town or the city and the more economic areas of a non-agricultural profile, the higher the capital rent and the lower interest in cultivating land.

Therefore, it seems that in the current legal environment, i.e. excluding agricultural land in urban centers from conservation by force of the Farm and Woodland Conservation Act, speculative activity will intensify. This will specifically refer to towns and cities where local plans of spatial development have not been approved.

## ACKNOWLEDGEMENTS

Analysis realized within a statutory research DS 3103/ZEiOR/2015.

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## **ZASOBY I WYKORZYSTANIE GRUNTÓW ROLNYCH W POLSKICH MIASTACH W ŚWIETLE WYBRANYCH TEORII LOKALIZACJI PRODUKCJI ROLNEJ**

**Streszczenie.** W pracy poddano weryfikacji hipotezę, że udział gruntów użytkowanych przez gospodarstwa rolne w powierzchni miast, a także zakres ich produkcyjnego wykorzystania są determinowane działaniem mechanizmu rent gruntowych. Wykazano, iż w bardzo dużych miastach (powyżej 500 tys. ludności) oraz miastach, gdzie występuje bardzo duże natężenie przedsiębiorstw z sektora pozarolniczego udział użytków rolnych jest odpowiednio o ponad 8,5 oraz 5,1 punktów procentowych mniejszy niż średnio w badanej populacji miast. Ponadto w jednostkach tych ponad 35% użytków rolnych nie było użytkowane rolniczo, podczas gdy średnio w polskich miastach odsetek ten wynosił około 28%. Duże znaczenie dla sposobu wykorzystania gruntów w miastach oprócz mechanizmu rent gruntowych mają również działania spekulacyjne oraz interwencja publiczna, które są najbardziej nasilone w dużych miastach oraz miastach o dużej liczbie przedsiębiorstw z sektora pozarolniczego.

**Słowa kluczowe:** użytki rolne, rolnictwo miejskie, lokalizacja produkcji rolnej, renta gruntowa

Accepted for print: 01.07.2015

For citation: Sroka W. (2015). Resources and use of agricultural land in Polish cities according to chosen theories of location of agricultural production. *Acta Sci. Pol., Oeconomia*, 14 (3) 135–147.