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PERCEPTION OF BENEFITS OF URBAN AND PERI-URBAN AGRICULTURE – A STUDY IN POLISH METROPOLITAN AREAS[1]

POSTRZEGANIE KORZYŚCI Z MIEJSKIEGO I PODMIEJSKIEGO ROLNICTWA – ANALIZA NA PRZYKŁADZIE POLSKICH OBSZARÓW METROPOLITALNYCH

Key words: urban and peri-urban agriculture, perception of benefits

Słowa kluczowe: miejskie i podmiejskie rolnictwo, postrzeganie korzyści

JEL codes: O18, O13, Q01

Abstract. The aim of the paper is to present opinions and perceptions of the benefits of urban and peri-urban (UPA) agriculture among inhabitants of Polish metropolitan areas (MA). The paper is based on a survey conducted among 512 inhabitants of Polish metropolitan areas. The research has shown that the concept of urban agriculture is relatively little known in Poland, and inhabitants are quite sceptical about the benefits generated by agriculture in metropolitan areas. A relatively low acceptance of agricultural functions was mainly expressed by inhabitants of MA's cores, and the further away from the core, the more highly they were rated. Significant social, environmental and economic importance was attributed to agriculture mostly by inhabitants of rural municipalities located further away from the MA core.

Introduction

In recent years, especially in countries of the global north (developed countries), there has been growing support and approval of the concept of urban agriculture [Lovell 2010, Mok et al. 2014]. Agriculture in urban and peri-urban areas (UPA) is perceived as a "counterbalance" to urbanised and densely populated areas. The main argument presented by promoters of the development of UPA is the claim that it contributes to sustainable development, as it fulfils a range of functions for the local community. Literature often emphasises the benefits of maintaining and restoring agriculture. They include, in particular, the creation of green infrastructure, the maintenance of biodiversity (preserving animal and plant habitats) and climate protection [Specht et al. 2016]. Social and culture-forming functions are also indicated, including social integration as part of common initiatives, the propagation of traditions and customs, etc. [Vickery 2014]. Urban agriculture also contributes to increased food security and enables the shortening of distribution channels [Sroka, Musiał 2016]. The growing popularity of urban agriculture is also a result of the trend of being "green". First of all, eco-cities are established, and governors of large metropolises are eager to boast about running urban farms and other forms of urban agriculture [F. Wang, K. Wang 2017].

However, agriculture in urban and peri-urban areas, despite numerous functions and benefits, generates a range of nuisances and conflicts. There are also doubts as to the quality and "healthiness" of products grown in urbanised areas [Mok et al. 2014]. Although scientific studies show that the benefits of agriculture in urban and peri-urban areas are higher than potential costs and threats [Specht et. al. 2016], they are only conducted theoretically or based on selected case studies. Moreover, scholars very rarely ask the opinions of those concerned, i.e. inhabitants of urbanised areas.

This paper is a preliminary analysis of the subject being investigated, therefore it will only address the differences in the perception of agriculture and its functions among those living in areas under varying urbanisation pressure, i.e. MA cores, municipalities directly bordering the cores and those situated further away from them.

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Material and methodology

The subject matter of the analyses covers the perception of UPA benefits generated in Polish metropolitan areas. The research material presented in this paper covers six selected monocentric metropolitan areas (MA): Warsaw, Krakow, Tricity, Poznan, Wroclaw, and Lublin MA. Based on planning documents (urban development plans or studies), the geographical scope of a metropolitan area was defined for each of the selected metropolises [Sroka et al. 2018]. Among the main sources of data were findings of own research carried out using a survey. The survey was conducted in the second half of 2017 and the first half of 2018. It consisted of questions concerning socio-demographic data of respondents and 6 chapters dedicated to the prerequisites of agricultural development and functions in metropolitan areas (26 questions, mainly closed ones). Survey responses were collected using elements of convenience sampling, and the interviewers, i.e. academics and employees of agricultural advisory centres, were instructed about the preferred places to carry out the surveys (fig. 1) and the characteristics of the respondents. It was assumed that in each of the metropolitan areas to be analysed the survey would be carried out in the core of the metropolitan area, in municipalities directly bordering the core (first zone of municipalities) and in municipalities situated further away from the core of MA (second zone of municipalities). The survey was conducted in 168 municipalities, i.e. in almost 60% of all the municipalities of the identified metropolitan areas. However, the number of survey forms collected in the different municipalities varied.

Most survey responses were collected using the CAWI technique (Computer assisted Web interview). However, older people preferred face-to-face contact with an interviewer, therefore the PAPI technique (Paper & Pen Personal Interview) was also used. The interviewers selected respondents of different ages, with various levels of education, and attempted to contact people living in various distances from the farmland (tab. 1). In total, 512 completed survey forms were collected, with 164 respondents inhabiting metropolis cores, 162 – municipalities directly bordering a city, and 186 – 20 other municipalities of metropolitan areas.

Due to the fact that filling the survey form took a relatively long time (up to 30 minutes), and not everyone was interested in the subject of the study (a frequent reason for refusal to participate in the survey), younger people having completed higher education dominate. Inhabitants of MA cores, i.e. large cities, in the vast majority of cases, lived far away from the nearest agricultural areas, rarely used farms and only a small share of them knew farmers personally. The further away from the core, the more often respondents declared using a farm or having closer

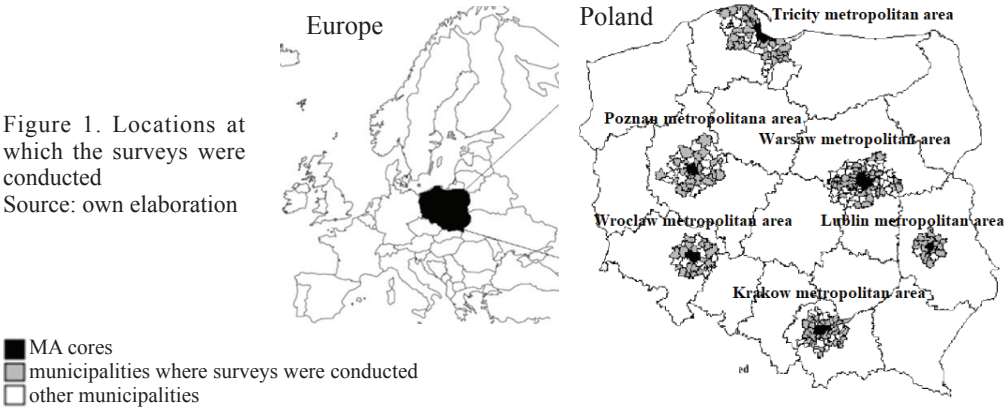

Figure 1. Locations at which the surveys were conducted
Source: own elaboration

Table 1. Characteristics of respondents (2017)

Specification	Core	Zone I	Zone II	Poland
Number of survey forms	164	162	186	-
Gender [%]:				
– females	60.1	56.7	50.9	51.6
– males	39.9	43.3	49.1	48.4
Age [%]:				
– 15-34 years	43.4	32.0	30.9	30.3
– 35-54 years	42.8	49.0	47.0	33.1
– 55-69 years	11.2	17.0	20.4	23.8
– ≥ 70 years	2.6	2.0	1.7	12.8
Education [%]:				
– higher	65.3	54.8	44.8	23.7
– secondary, post-secondary non-tertiary	28.8	35.6	37.7	33.8
– basic vocational	4.6	9.6	14.8	24.2
– other	1.3	0.0	2.7	18.3*
Possesses or uses [%]:				
– farm	5.7	21.1	31.8	13.5**
– kitchen garden	26.4	49.5	46.7	no data
– balcony with flowers and herbs	33.3	19.6	13.6	no data
The distance from the place of residence to the nearest farmland [%]:				
– less than 100 m	3.2	32.7	36.4	no data
– 100 -500 m	6.5	34.7	23.9	no data
– 500-2000 m	14.3	19.7	23.9	no data
– more than 2000 m	76.0	12.9	15.8	no data
Does the respondent know farm owners personally? [%]:				
– yes, a lot	3.9	34.7	56.0	no data
– yes, but not many	17.5	38.8	29.3	no data
– no	78.6	26.5	14.7	no data

* The data pertain to people aged over 13, therefore there is a large share of people with a lower level of education than vocational; ** Share of people working on farms in the number of people aged over 15 – data for 2010
Source: own study

contact with agriculture and people working in agriculture. These last characteristics provide a quite realistic picture of the structure of inhabitants in the different areas. Participants were selected according to their willingness to partake. The survey can therefore be characterized as an exploratory, non-probability sampling survey. It is thus not considered to be statistically nor demographically representative of the residents of Polish metropolitan areas. However, this exploratory approach is appropriate because it offers preliminary insights into a previously unexplored topic [Specht et al. 2016].

General (deductive, reductive reasoning, comparisons) and quantitative methods were used in the paper. For rating the perception of the functions of agriculture, the Likert scale was used, which is one of the most widely applied tools for measuring attitudes among the population towards a certain phenomenon [Jezior 2013]. The analyses were presented using tables and charts.

Research findings

In the analyses presented in this paper, urban and peri-urban agriculture was examined in terms of its contribution to social, environmental and economic welfare of communities inhabiting metropolitan areas. The respondents were asked to rate, on a 5-point scale (Likert scale), to what degree they agreed with the benefits of UPA. When assessing the social functions of agriculture,

Table 2. Social functions of (peri-)urban agriculture in the locality assessed

Specification	Core		Zone I		Zone II	
	SA and Ap* [%]	average **	SA and Ap* [%]	average **	SA and Ap* [%]	average **
Is an important element of social security for the poorest families (production of agricultural products protects against abject poverty)	35.9	-0.23	42.6	0.07	56.2	0.41
Is an important sector that creates jobs for inhabitants	28.3	-0.46	33.1	-0.23	46.4	0.11
Contributes to improving life quality of inhabitants, as it creates an open and attractive space for recreation and rest	47.1	0.15	44.6	0.23	50.3	0.35
Fulfils an important role in the creation of jobs for the disabled, individuals with mental disorders, etc., and can prevent social exclusion of such individuals,	22.7	-0.46	12.8	-0.89	15.4	-0.72
Fulfils an important role in the education of children and youth by offering various services such as bread baking or dumpling making courses, etc.	41.8	-0.03	31.1	-0.37	39.0	-0.05

* SA – strongly approve, Ap – approve, ** The averages of the questions on the five-point scale are summarized by giving numerical value to the answers ranging from 2 ("strongly agree") through 1 (agree) and 0 ("neither agree nor disagree") to -1 ("disagree") and -2 (strongly disagree"). The same way of quantification of the Likert scale was used by Kathrin Spech et al. [2016] and Esther Sanyé-Mengual at al. [2018]
Source: own study

respondents most appreciated the possibility of spending their free time in open green areas, whereas relatively little importance was attributed to the role of agriculture in creating jobs, including jobs for the disabled (tab. 2). However, the inhabitants' assessment varied greatly, and in the case of the majority of the functions, agriculture was assessed least positively by inhabitants of MA cores. The average score calculated for the responses[2] shows that only in the case of the function of improving life quality by creating space for recreation, the respondents who agreed with this statement outnumbered those who disagreed. The other social functions of UPA met with significant scepticism. It was also observed that the further away from the core, the higher the importance of agriculture was rated. In municipalities located further away from the core (zone II), respondents perceived agriculture as still fulfilling an important function of providing social security to the poorest or as an important sector that creates jobs. However, respondents were very sceptical when it comes to the creation of jobs for the disabled.

The positive perception of environmental functions of agriculture, as in the case of social functions, was mainly observed among inhabitants of zone I and zone II. Inhabitants of MA cores mainly appreciate the positive impact of agricultural areas on airing the city, providing beautiful landscapes, and the culture-forming function (in all cases, over half of respondents agree with these statements), but outside of MA cores these functions were much more appreciated. Thus, inhabitants of cities are quite sceptical about the benefits of maintaining agriculture in their environment. They rate the contribution of agriculture to the protection of biodiversity, prevention of the spread of invasive plants and reduction of the effect of an urban heat island relatively low. Surprisingly, the last function was much more appreciated by inhabitants of municipalities located outside of MA cores, who are not directly affected by this benefit of urban agriculture, as it mainly concerns inhabitants of MA cores.

[2] When the calculated average is less than 0, it means that rather more people approve or strongly disapprove the statement they are presented with.

Table 3. Environmental functions of (peri-)urban agriculture in the locality assessed

Environmental functions	Core		Zone I		Zone II	
	SA and Ap* [%]	average **	SA and Ap* [%]	average **	SA and Ap* [%]	average **
Contributes to maintenance of high biodiversity of fauna and flora (various species of plants, wild animals)	44.1	-0.03	65.3	0.66	68.3	0.80
Enhances the cultural landscape (e.g. visually attractive blossoming rapeseed fields, beautiful landscape)	56.3	0.31	80.1	1.05	80.5	1.17
Strengthens local identity and contributes to the preservation of cultural diversity at the local, regional and national levels (cultivation of customs, traditions, etc.)	52.0	0.17	63.3	0.74	71.0	0.94
Contributes to the reduction of CO_2 emission and reduces the effect of the so-called urban heat island (more greenery means less concrete that makes the city warmer)	47.7	0.23	74.3	0.99	64.4	0.82
Contributes to the protection of soil against water and wind erosion,	49.3	0.17	62.8	0.81	64.8	0.90
Has a positive impact on „airing of the city" and improves the quality of air	58.6	0.36	75.5	0.97	69.2	0.85
Prevents the spread of invasive plants and other unaccepted changes in agricultural and forest ecosystems	45.4	0.11	60.8	0.76	60.1	0.76

Description * and ** in tab. 2
Source: own study

Table 4. Economic functions of (peri-)urban agriculture in the locality assessed

Economic functions	Core		Zone I		Zone II	
	SA and Ap* [%]	average **	SA and Ap* [%]	average **	SA and Ap* [%]	average **
Fulfills an important function of „the provider of food to cities" by supplying agricultural products	43.0	0.03	53.4	0.39	65.2	0.68
During emergencies it increases food security in cities and neighbouring municipalities (independence from food supplies from „far away")	52.3	0.25	55.8	0.52	63.2	0.73
Enables reduction of the time it takes to transport agricultural products to the consumer, which helps to keep them fresh,	56.3	0.39	57.4	0.48	65.8	0.81
Supplies agricultural products that are safe, as the consumer is able to observe the process of their production (I see how plants are grown, I know how livestock are raised, etc.)	49.7	0.10	58.8	0.57	65.4	0.78
It fulfills an important role by supplying raw materials to the food sector and industry (e.g. biodiesel, energy generation, etc.)	36.7	-0.03	37.6	0.07	50.0	0.41

Description * and ** in tab. 2
Source: own study

When viewing the economic role of agriculture, respondents rated the shortening of distribution channels and the possibility of supplying fresh products most highly. The function of increasing food security in emergencies and the safety of products produced in urban and peri-urban agriculture were also rated relatively highly.

Of relatively small importance, especially in the eyes of inhabitants of MA cores, was the function of "the provider of food to cities" and supplier of raw materials to industry. Analysis of the differences in inhabitants' responses across different parts of metropolitan areas shows that also in this case, respondents living outside of cities rated the benefits of UPA much more highly. Except for the last function (supplying raw materials to the food sector and industry), respondents living outside of MA cores mostly agreed with the statement concerning the huge economic significance of urban and peri-urban agriculture.

Summary and discussion

Urban and peri-urban agriculture in global north countries is intensively promoted and indicated as a chance for sustainable development of metropolitan areas. It is stressed that by providing a range of benefits, it contributes to the improvement of inhabitants' quality of life. This is confirmed by case studies in such countries as Germany [Specht et al. 2016], Italy [Sanyé-Mengual et al. 2018] and the USA [Poulsen 2015], where UPA is perceived positively not only by experts but also inhabitants. In Poland, the situation is different, because the concept of urban agriculture is relatively little known. Research shows that in Poland opinions on the legitimacy of maintaining agriculture in areas subject to urbanisation differ even among experts, i.e. scholars and representatives of the agricultural advisory sector [Sroka et al. 2017]. This paper analysed the perception of urban and peri-urban agriculture among inhabitants of metropolitan areas living in both highly urbanised areas and those located on the peripheries of metropolitan areas. The findings of the research are not optimistic, as only certain functions of agriculture are perceived very positively. Benefits of urban and peri-urban agriculture are rated particularly low by inhabitants of MA cores, who contest environmental and social benefits of this type of agriculture. For comparison, research conducted in Berlin showed that its population highly appreciates the creation of open spaces by agriculture where people can spend their leisure time (over 75% of responses). Over 75% of Berlin's inhabitants think that agriculture provides environmental benefits in terms of climate, resources and transportation. Similar findings were obtained in research conducted in Italy (Bologna), where also almost 75% of inhabitants agree with the statement about the positive impact of agriculture on the quality of life in the city [Sanyé-Mengual et al. 2018]. In the cores of Polish metropolitan areas, such claims are supported by around 40-60% and is comparable with the findings of research conducted in Mexico, where inhabitants also do not notice many positive impacts of agriculture [Nadal et al. 2018].

The aim of this paper was not to identify the causes of differing perceptions of agriculture, but it should be noted that inhabitants of the cores of Polish metropolitan areas have little knowledge on agriculture and most of them (erroneously) think that no agriculture exists in their city. Over 35% of them are not interested in or have no possibility of maintaining a kitchen garden or even use their balcony to grow herbs or flowers. Moreover, over 3/4 of inhabitants of MA cores live far away from agricultural areas and do not know any farmers personally. These characteristics differ significantly in the case of inhabitants of areas located outside of MA cores. The respondents inhabiting such municipalities are more likely to use farms themselves or at least they live surrounded by agricultural areas. Their perception of agriculture is much more positive, and they are aware of its social, environmental and economic benefits. It seems that their assessment is connected with greater awareness and knowledge of agriculture. This issue will be developed in the subsequent papers.

This paper has some limitations that are concerned with the use of a survey, mainly about the scope of understanding by the respondents appropriate questions and specialist terms. Pilot studies and problems indicated for example in the analysis made by Kathrin Specht et al. [2016] and Esther Sanyé-Mengual et al. [2018] enabled to eliminate expressions which respondents had interpretative problems. In order to eliminate that risk, the interviewers aim was to help in explaining the chosen terms. What is more, at the end of the survey, both telephone number and e-mail of the author was provided.

There was also an additional space for respondents to explain their doubts and clarify their own assessments. Some problems were concerned with the understanding of the notion of "urban agriculture" by inhabitants of the MA cores. It was because some claim that in their city there is no agriculture. However, in an introduction to survey it was explained that respondents should refer to the function of agriculture located in their surrounding areas, e.g., agriculture in the outskirts of the city (but still within their administrative limits). There was no problem with the cohesion of a notion such as "peri-urban agriculture".

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Streszczenie

Celem opracowania jest przedstawienie opinii i sposobu postrzegania przez mieszkańców polskich obszarów metropolitalnych korzyści z miejskiego i podmiejskiego rolnictwa. Do badań wykorzystano ankietę przeprowadzoną wśród 512 mieszkańców polskich obszarów metropolitalnych (OM). Z badań wynika, że koncpecja „miejskiego rolnictwa" jest w Polsce słabo znana, a mieszkańcy sceptycznie podchodzą do korzyści, jakie generuje rolnictwo na obszarach metropolitalnych. Relatywnie niską akceptację funkcji rolnictwa przedstawiali głównie rdzenni mieszkańcy metropolii, a wraz z oddalaniem się od rdzenia, oceny były wyższe. Duże znaczenie społeczne, środowiskowe i ekonomiczne rolnictwu przypisywali przede wszystkim mieszkańcy gmin wiejskich położonych w dalszej odległości od rdzenia obszarów metropolitalnych.

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