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ASSESSMENT OF THE IMPACT OF PUBLIC GOODS ON INCOME OF AGRITOURISM FARMS IN THE COMMUNES OF WESTERN POMERANIA

OCENA WPŁYWU DÓBR PUBLICZNYCH NA DOCHODY GOSPODARSTW AGROTURYSTYCZNYCH W BADANYCH GMINACH POMORZA ZACHODNIEGO[1]

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Summary. The paper analyzes the impact of public goods on the economic size of agritourism farms in the Western Pomerania province. To achieve this goal, data from the survey of 150 tourist farms (economic variables) conducted in 2012 were used and spatial differentiation was performed with regard to the attractiveness of 103 Western Pomeranian communes in terms of access to selected public goods. For this purpose, the author applied a synthetic measure of tourist attractiveness of communes based on selected public goods (environmental variables). In result, four groups of communes were distinguished which served to determine the dependence of the variables on the presence of environmental public goods in Western Pomerania communes. The next stage of the study was to assess the impact of public goods on the economic size of the surveyed farms.

Key words: agritourism, public goods, income.
Słowa kluczowe: agroturystyka, dobra publiczne, dochody.

INTRODUCTION

Rural communes in Poland show considerable spatial diversification in terms of socio-economic development, settlement structures, and social and technical infrastructure. This diversification results from the following factors: location, the rank and nature of agriculture in regional development, demographic situation, labour market condition, rural resources, activity of local government and local communities, local skills and traditions. Consequently, there may development can take different forms. On the one hand, the development of agritourism in rural areas may be an alternative to traditional directions, including farming and related services (Brelik 2004). On the other hand, it may be a crucial complement to traditional rural resources. Ensuring the continuity of managing agricultural land is the precondition of landscape conservation from both cultural and ecological perspective (Czyżewski 2009).

The source literature distinguishes natural landscapes (formed by natural conditions without human interference) and cultural landscapes (created by human actions). Poland's unique rural landscape is marked by dirt roads, overgrown ditches, streams, humid dune

slacks, marshes, waterholes, balks, creeks, natural river banks, shrubs, trees, alleys, wayside shrines, old mills, glacial erratics, buffer strips, forests, the diversity of crops on neighbouring fields, adjacency zones, semi-natural grasslands, which are occupied by various species of wild animals and plants. A way to experience nature is to purchase private goods (agritourism holidays). This implies the risk of transforming public goods into club goods (Czyżewski and Brelik 2013). Preservation of different landscape features in rural areas boosts their attractiveness and enables tourism development, especially, wildlife tourism. Development of businesses depends on the availability of public goods and their quality. Consequently, these goods influence the living standards in particular locations that appeal to tourists. Agritourism farms benefit from many public goods, which are influenced by agriculture, such as fresh air, wide open spaces and cultural values.

METHODOLOGY

Synthetic measure of tourist attractiveness of communes based on selected public goods was defined in order to evaluate the spatial diversification of attractiveness in 103 Western Pomeranian communes in terms of incidence of particular public goods.

The choice of variables for this measure was based on literature review and analysis of quantitative data from Concise Statistical Yearbook of Western Pomerania (2011). As a result, fifteen attributes of public goods were determined:

X_6 – forest cover [%];

X_7 – the areas being potential holiday destinations [ha/km^2];

X_8 – the number of lakes in the category 1 municipality [quantity];

X_9 – the number of lakes in the category 2 municipality [quantity];

X_{10} – the number of lakes in the category 3 municipality of [quantity];

X_{11} – the number of lakes in the category 4 and 5 municipality [quantity];

X_{12} – the area of protected areas [ha/1 km^2];

X_{13} – the number of parks [the number/1 km^2];

X_{14} – the area of nature reserves [ha/1 km^2];

X_{15} – the number of natural monuments [number/1 km^2];

X_{16} – the area of Natura 2000 sites [ha/1 km^2];

X_{17} – the number of National Parks [number/1 km^2];

X_{18} – the share of agricultural land (UAA) in the total area [%];

X_{19} – the share of grassland in the total area UR [%];

X_{40} – categorized distance from the sea;

X_{41} – protected landscape areas in hectares.

Among the above attributes we can distinguish both stimulants and destimulants, which means that these attributes affect the synthetic indicator in two ways. The first ones increase it (positive impact), and the latter decrease (negative impact). Hellwig's parametric method was used to select the diagnostic features (Nowak 1990). The coefficient matrix was determined, then central features and isolated features were selected, which allowed to set up a basic framework of features.

In order to assess the impact of environmental public goods on the economic size of the surveyed households we used selected economic variables obtained from the survey:

X_{23} – farm area [km^2];

X_{26} – the number of beds in an agritourism farm;

X_{28} – the total number of tourists visiting agrituorism farms per year;

X_{29} – the number of overnight stays in tourist farms [the number of people/year];

X_{31} – the level of single farm payments [PLN per km^2];

X_{34} – income from an agritourism farm [PLN];

X_{37} – turnover rate;

X_{38} – average price for overnight stays;

X_{39} – indicator of the average number of overnight stays on farms.

Kruskal-Wallis tests were conducted for those variables with a division into four groups of communes.

RESULTS

The first stage of the research aimed at determining the spatial diversification of attractiveness of Western Pomeranian communes in terms of access to public goods. Synthetic indicator values were used to form typological groups of communes according to the occurrence of public goods. Fifteen communes (15%) were classified in the first group. These were the communes scoring the highest with regard to the selected diagnostic features and showing an indicator value of above 0.4663. These are the most attractive communes in terms of occurrence of public goods. The following factors influenced the high level of synthetic indicator of attractiveness in the researched communes (Borne Sulinowo, Człopa, Drawno, Wolin, Czaplinek, Węgorzyno, Myślibórz, Ińsko, Tuczno, Polanów, Drawsko Pomorskie, Manowo, Bierzwnik, Chociwel, Kalisz Pomorski): high afforestation, a large number of second class lakes, presence of nature reserves and natural monuments, conservation areas and Natura 2000 protection areas. The second typological group consisted of 27 communes (26%) which showed a satisfactory level of attractiveness, with the indicator between 0.2960 and 0.4663. As the research revealed, the communes with the average level of attractiveness (group III) dominate the whole group, with an indicator between 0.1256 and 0.2959. The last group (group IV) consisted of only nine communes, including: Warmice, Suchań, Kozielice, Dolice, Przelewice, Stara Dąbrowa, Grzmiąca, Pyrzyce, Stargard Szczeciński, Bielice, showing a very low level of attractiveness as in terms of access to public goods.

It must be noted that apart from attributes of the communes' attractiveness in terms of access to public goods, analysed in the research, many other factors may also affect the results. Although the research on public goods in agriculture has grown in the recent years, only environmental goods are relatively well-defined in the literature, whereas public goods still await exploration. Extensive research is difficult to carry out because it requires the formulation of many complex indicators or measures related to the valuation methods. Most of the research and indicators refer to the landscape and biodiversity of arable areas, but it is easily noticeable that the measures proposed by various projects are often replicated.

The four groups of communes allowed to find the relation between variables describing agritourism activities of farms and the existence of environmental goods in Western Pomeranian communes. The second stage of the research, the author attempted to assess the influence of public goods on the economic size of the study farms.

Table 1. The results of Kruskal-Wallis test and statistically significant differences between groups of communes indicating the economic potential of the surveyed households

Specification	I group of municipalities	II group of municipalities	III group of municipalities	IV group of municipalities	Value p
Farm area [km^2] (X_{23})	28,04	17,90	26,47	50,90	0,2537
Number of beds in agritourism farms (X_{28})	192	228	189	38	0,0770*
Number of beds agritourism farms (X_{26})	19	20	17	11	0,2999
Indicator of the average number of overnight stays on farms (X_{39})	35	36	35	11	0,4166
the level of single farm payments [PLN per km^2] (X_{31})	30,74	19,87	27,57	50,90	0,3535
Number of overnight stays in tourist farms [the number of people/year] (X_{29})	566	634	480	93	0,0785*
Turnover rate (X_{37})	2,91	2,67	2,75	2,62	0,3020
Average price for an overnight stay (X_{38})	38,35	37,42	36,85	34,44	0,5767
Income from agritourism farm [PLN] (X_{34})	43962,29	49436,05	42639,93	927,22	0,0588*

* Statistically significant differences at the significance level α = 0.1 test.

The analysis conducted proved that the total number of tourists differs statistically (p = 0.077) in particular groups of communes. Communes from group I (192 tourists per year) and group II (228 tourists per year) are most frequently visited by tourists, whereas group IV communes have the lowest tourist traffic (38 tourists per year). The number of overnight stays is also the highest in the communes from group I (566 tourist nights per year) and group II (634 per year), whereas group IV features the lowest number of tourist stays (93 tourist stays per year), and the difference is statistically significant (p = 0.0785) on the significance level α = 0.1. (Table 2). This also translates into statistically significant (p = 0.0588) dependence on agritourism income (variable X_{34}) in given commune groups, where the income in group I averaged 43962.29 PLN and in group II 49436.05 PLN whereas in group IV only 927.22 PLN. The analysis conducted proved that the overall number of tourists differs statistically (p = 0.077) in particular groups of communes. Communes from group I (192 tourists per year) and group II (228 tourists per year) are most frequently visited by tourists, whereas group IV communes have the lowest tourist traffic (38 tourists per year). The number of overnight stays is also the highest in the communes from group I (566 tourist nights per year) and group II (634 per year), whereas group IV features the lowest number of tourist stays (93 lodgings per year), and the difference is statistically significant (p = 0.0785) on the significance level α = 0.1. (Table 2).

Table 2. Annual number of tourist visits in the studied communes

Specification	Group of communes	Average	Standard deviation	Coefficient of variation* [%]
Annual number of tourist visits to agrituorism farms [number] (X_{28})	I	192	156	102
	II	228	213	93
	III	189	148	78
	IV	38	8	21

* Coefficient of variation = standard deviation / mean.

As evident in Figure 1 and Table 2, thethe annual number of tourists (228) was higher in group II than in group I (192), but it was marked by high variation (93%). The annual number of tourists using agritourism facilities was strikingly lower (38) in group IV and was marked by low variability (21%). This may be due to the fact that the occurrence of public goods influences agritourism traffic in the group where the study was carried out.
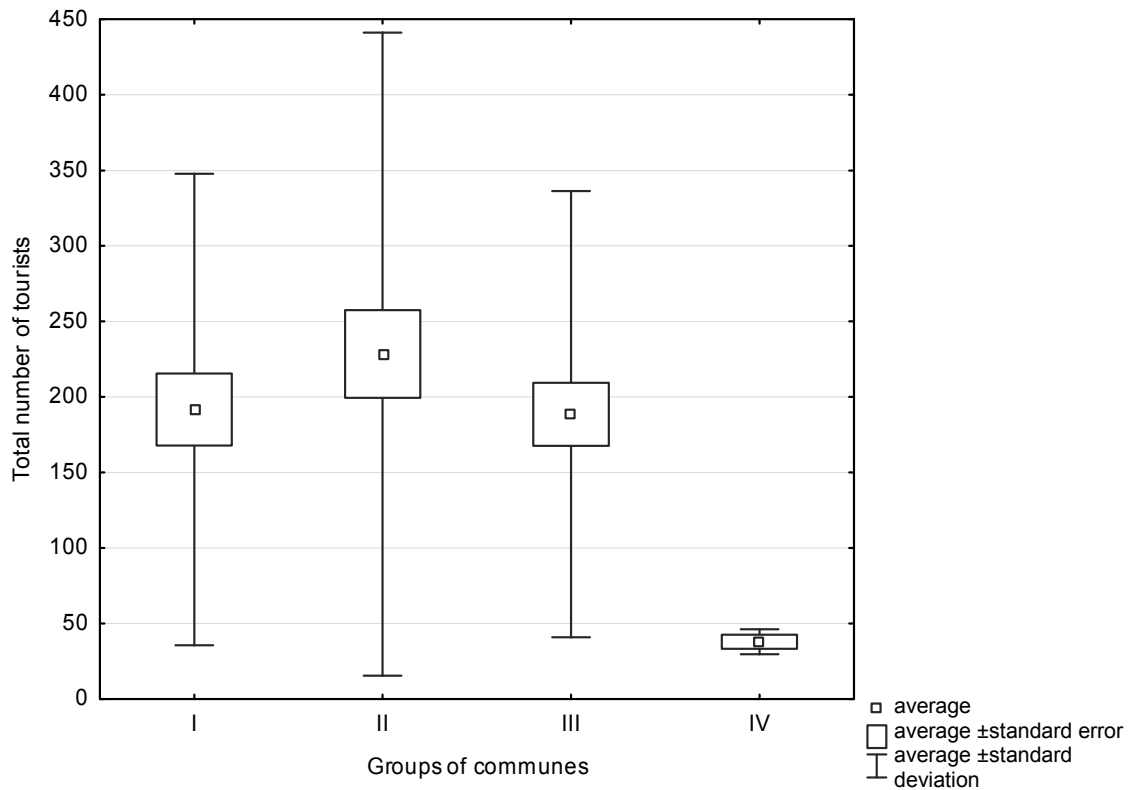

Fig. 1. Overall number of tourists in each group of the commune groups

Also, the annual number of tourist visits was diversified by the synthetic measure of tourist attractiveness in terms of access to public goods. Table 3 presents the level of diversification.

Table 3. Annual number of overnight stays in particular groups of studied communes

Specification	Group of communes	Average	Standard deviation	Coefficient of variation* [%]
The number of overnight stays in farm tourism (X_{29})	I	566	488	102
	II	634	665	105
	III	480	352	73
	IV	93	24	26

The Table shows that in group II the average number of overnight stays per year (634) was higher than in group I (566), but was marked by higher (105%) divergence than in group I. group IV showed by far the lowest number of tourist stays (93) and was marked by slight divergence (26%) (cf. also Fig. 2). In conclusion, the findings indicate that access to public goods influences the overall number of tourist stays in of the households analysed.
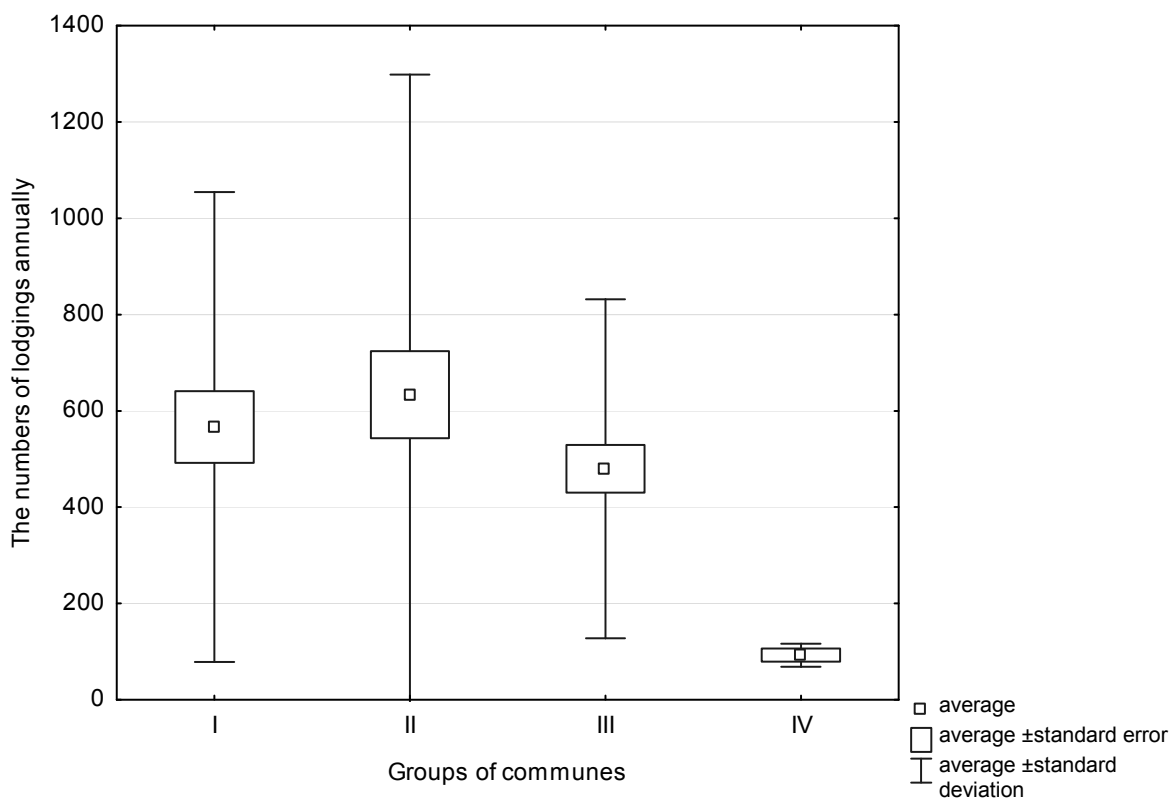

Fig. 2. Annual number of overnight stays in the four groups of communes

The attractiveness of communes in terms of access to public goods is the cause of disparity in income generated by agritourism farms in Western Pomerania, which is illustrated in Table 4.

Table 4. Income of agritourism farms that participated in the research

Economic factor	Group	Average	Standard deviation	Coefficient of variation [%]
Agritourism income (X_{34})	I	43962.29	49517.52	102
	II	49436.05	44176.15	89
	III	42639.93	43343.51	102
	IV	927.22	3145.69	339

The data presented in Table show that in group II communes the income from agritourism is the highest (43436.05), and the diversification is the lowest, that is 89%. Agritourism income in farms included in group I and III were at a similar level. However, in group IV the income of farms was overwhelmingly lower (927.22), marked by very high variability (339%) (cf. Fig. 3).
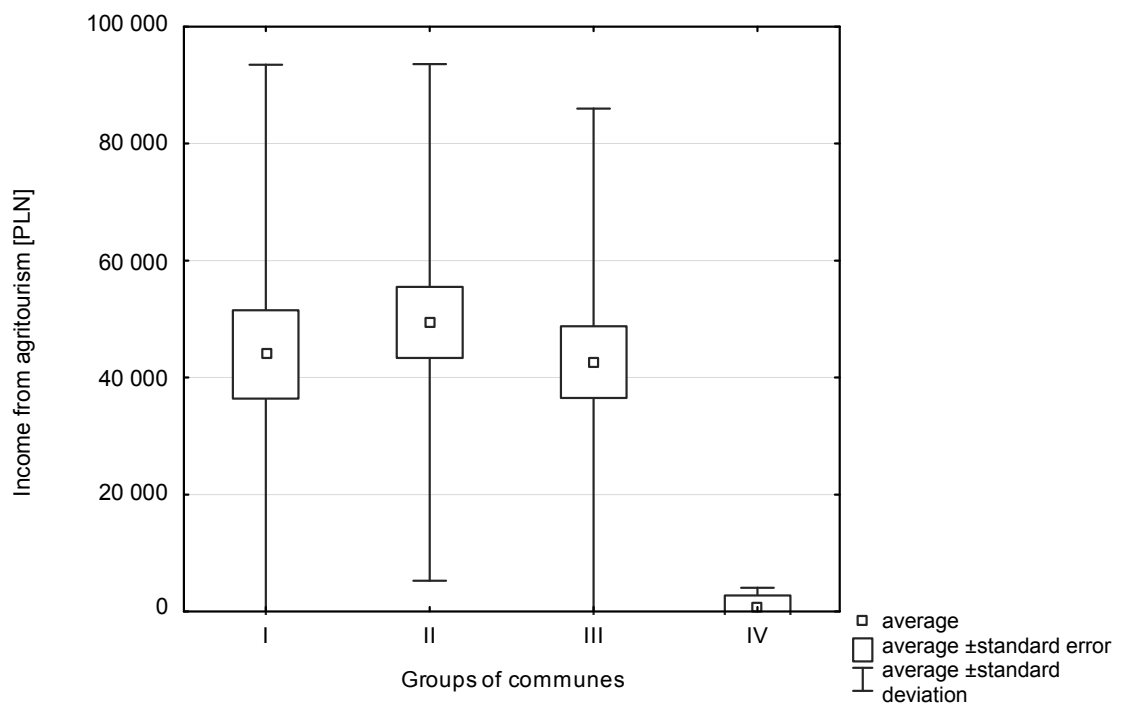

Fig. 3. Income from agritourism in particular groups of communes

Other economic variables such as farm's acreage, number of lodgings, the indicator of average lodgings, the size of single farm payments, goods in process turnover, and the average price of accommodation are not statistically significant in particular groups of communes in Western Pomerania.

CONCLUSION

The research reveals that the income generated by agritourism farms is strictly dependent on public goods, especially those environmental, which are supplied by rural areas and farming. The chance to experience nature is partially financed through purchasing private goods (agritourism holidays). Preserving different elements of landscape and its accessibility in rural area increases the site's tourism appeal, as well as its tourism development potential, which is particularly true for wildlife tourism.

The importance of public goods in agritourism may also be assessed according to the Tiebout model which says that we may expect that tourists will choose tourist locations with the best access to public goods . Nevertheless, the model should be expanded by introduction of various scales of public goods, keeping in mind that citizens that choose a particular location have similar expectations and demand for public goods. A jjuxtaposition of these two values will allow to answer the question which public goods are crucial for agritourism farms and who should bear the costs of their supply. The second aspect is also connected with the communes' income. The Tiebout model solves the problems related to revealing preferences (there is no need to tell lies, as there is no effect of 'fare dodging') and aggregation of preferences (each location has an approximate level of demand). Economic benefits generated by tourists visiting particular communes should encourage valorisation of resources related to public goods supply. This will induce capital expenditure to these public goods that were identified because of tourism movement.

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Streszczenie. W pracy przedstawiono wpływ dóbr publicznych na wielkości ekonomiczne gospodarstw agroturystycznych Pomorza Zachodniego. Do tego celu posłużono się danymi z przeprowadzonych w 2012 roku badań ankietowych w 150 gospodarstwach agroturystycznych (zmienne ekonomiczne) oraz dokonano przestrzennego zróżnicowania poziomu atrakcyjności 103 gmin województwa zachodniopomorskiego, w aspekcie występowania wybranych dóbr publicznych, za pomocą syntetycznego miernika atrakcyjności turystycznej gmin, na podstawie wybranych dóbr publicznych (zmienne środowiskowe). Wyodrębnione cztery grupy gmin posłużyły do ustalenia zależności zmiennych opisujących działalność agroturystyczną badanych gospodarstw od występowania środowiskowych dóbr publicznych w gminach Pomorza Zachodniego. Kolejnym etapem badań była próba oceny wpływu dóbr publicznych na wielkości ekonomiczne badanych gospodarstw.