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The role of natural conditions in qualified agritourism – case of Poland

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Abstract: The article investigates the role of natural conditions in the development of the qualified form of rural tourism, which the authors define as qualified agritourism. The research hypothesis assumes that rural space, which is characterized by high natural conditions, complemented in sporting infrastructure, can support the development of qualified agritourism. The empirical survey examines the relationship between the sightseeing and natural conditions and the conditions for physical recreation occurring on agritourism farms in Poland. Further, the findings suggest that, in the opinion of the hosts and guests of agritourism farms, undertaking of physical recreational activity and its intensity are influenced by the favourable sightseeing and natural conditions, the number of offered forms of physical recreation and the availability of sports equipment.

Keywords: active tourism, natural resources, modified Paffenberger's index, physical recreation, rural areas

The possibility of close or direct contact between humans and nature has always been an important factor in the development of tourism in rural areas. One can observe the phenomenon of escaping from mass tourism towards non-urbanized areas with traditional social structures, possessing a small-scale infrastructure, where the intensity of tourist movement is rather low (Majewski and Lane 2003: 10; Dolnicar et al. 2008). Rural tourism focuses on homestays, local foods, handicrafts, small businesses and low-impact transportation (Park and Yoon 2011). It strengthens the economic and social advantages of rural areas while limiting any negative impact on the natural, historic, cultural or social environment (Bramwell and Lane, 1994; Berry and Ladkin 1997; Hall and Richards 2003; UNEP and UNWTO 2005: 11–12). Many people are trying to make use of the rural space also in the active way, undertaking various forms of physical recreation.

Rural tourism in its broad sense is a form of tourism implemented in rural areas. One can distinguish also the agritourism, which involves bringing guests to a farm. Rural areas are often areas of a high sightseeing and natural attractiveness which favour varied forms

of activities related also to the so-called qualified tourism. In that sense, agritourism complemented by the appropriately specialized offer directed towards recreational sports can be named “*qualified agritourism*” and is the most specialized form of tourism in rural areas.

A significant part of rural areas in Poland can be considered favourable for the development of rural tourism, because the quality of the natural environment is mostly high, and the forms of farming and agricultural use remain mostly traditional (Brelík 2009: 17–20). In addition, under the influence of multifunctional sustainable rural development policies, there are also observed changes related to the dynamic development of non-agricultural (social, economic and cultural) functions of these regions. Agritourism has been developing in Poland since the early 90s, however, this process is not the same in all regions (Wiatrak 2003: 9–18). This form of tourism is popular in the areas characterized by a particular tourist attractiveness, especially by natural conditions. The development of rural tourism, including agritourism, is visible in both: the growing number of accommodation providers, as well as in

the expanding range of services and their increasing quality (Tyran 2005).

Therefore, it is important both from the scientific and utilitarian point of view, to carry out studies on the development of rural tourism in Poland and the conditions that encourage guests to undertake physical activity, especially with the use of the sight-seeing and natural conditions of the region. During the research work, the authors tried to answer the research question whether the occurrence of high natural conditions influences the conditions for physical activity, which is the necessary element of *qualified agritourism*. The adopted hypothesis assumes that rural space in Poland, which is characterized by high natural conditions, complemented in sporting infrastructure, can support the development of rural qualified tourism. It was also assumed that in the development of qualified agritourism, besides the natural conditions, the occurrence of adequate anthropogenic conditions is also necessary. In order to implement the function of sports and recreation in an agritourism activity in rural areas, one should provide conditions for determining physical recreation such as sports facilities with access to sports and recreational equipment. Hence, the main aim of the research presented in this paper is to establish the relationship between the occurrence of the conditions for physical recreation in rural areas and the intensity of physical activity undertaken by tourists choosing agritourism farms as their place of rest. Another aim is to create precisely the definition of qualified agritourism and to determine the conditions necessary for its development.

QUALIFIED AGRITOURISM AS A SPECIALIZED FORM OF RURAL TOURISM IN POLAND

Tourists are increasingly becoming oriented to a close or direct contact with nature through hiking and cycling tourism, canoeing, horse riding and other forms of recreation, feasible mainly or often solely outside big cities. Thus, the reason for the choice of rural areas by the tourists is not only the search for a different environment, the escape from the noise and other discomforts and inconveniences of living in large urban agglomerations. They feel both the need for the contact with nature and the need for physical activity. They are interested in the natural and cultural heritage of the region, they care for the

environment; but also for their health and well-being (Agapito et al. 2012: 325; OECD 1994; Butler et al. 1997; Roberts and Hall 2001; Jackiewicz 2005: 266; Kastenholtz 2005; Albacete-Sáez et al. 2007; Raszka and Krajewski 2009: 40; Popescu and Badita 2011: 130).

The charm of the rural landscape, natural conditions and the atmosphere of rural life are the most important values attracting tourists (Staniewska-Zątek 2007: 69), and they may have even a spiritual dimension (Davies and Gilbert 1992: 56–63; Sharpley and Jepson 2011: 52–71). These factors contribute to the development of rural tourism, which is the activity taking place in a non-urbanized area with the traditional social structures, the atmosphere of locality and a small-scale accommodation (Majewski 1994: 12; Majewski 2000: 8). It is an activity based on personal contacts with the hosts and the inhabitants of the reception areas. It also includes the low-intensity recreation forms, not interfering much with the natural environment, and all the same, it positively influences the sustainable development of rural areas (Bramwell and Lane 1993: 1–5; Majewski 1998, Park and Yoon 2011: 401–415; Mihailovic and Moric 2012: 268; Pitoska 2013) and is an important tool for the development of the regions affected by both social and economic problems (OECD 1994; Sharpley and Roberts 2004; Kastenholtz 2005). Rural tourism and agritourism stimulate the development of agricultural farms, activate the local labour market and increase the wealth of the rural population and local budgets. There are also other positive social and cultural phenomena and benefits to the destination community (Simmons 1994), such as: an increase in housing standards of the population providing tourist services, the expanding market of food products, the professional activation of women in rural areas (Friedmann 1980; Gasson 1980; Iakovidou and Turner 1994; Garcia-Ramon et al. 1995; Burr 1999; Oldrup 1999; Petrzelka et al. 2005), stimulating the development of local infrastructure and undertaking joint local initiatives (Campbell 1999), the protection of the cultural and natural heritage of rural areas, the growth of the cultural identity and cultural development of the rural population, the development of crafts and folk handicraft (MacDonald and Jolliffe 2003: 308). Hence, the development of rural areas in Poland is a good example of the sustainable rural development and the sustainable rural tourism development.

It should also be emphasized that not every rural area has a predisposition of becoming a destination for tourism (Kowalczyk 1993; Łagowska and Michalowski

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2007: 302). Natural and landscape features of those areas are a special kind of commodity that can be sold only if it is kept in a perfect condition (Jalinik 2002: 20–47; Woźniak and Stec 2008: 24). Residents of rural areas who run the non-agricultural tourism business should make use of the existing recreation and tourism infrastructure, as well as prepare it themselves, especially that they often organize the events and attractions, such as the horse riding, cycling, guided tours of the parks or reserves, mushroom picking expeditions, kayaking and more. Therefore, agritourism, as well as the qualified tourism, can be one of the most important and most accessible forms of the active recreation in rural areas.

Qualified tourism is considered to be the highest form of specialized tourism that requires from the tourist a mental and physical preparation, the ability to behave appropriately in the natural environment, the ability to make use of the tourist equipment (Łobożewicz and Bieńczyk 2001: 118–146), or the contact with animals. It can also be implemented in rural areas based on the offer of an agritourism farm and that is why the use of the rural natural environment is important. Qualified tourism in rural areas is an easily accessible form of tourism supporting the renewal of the strength of people who live the urban lifestyle, making it easier for them to take up a variety of leisure forms related to the physical recreational and tourism activity. That is why the authors of this paper suggest distinguishing a new sub-discipline of agritourism, namely the *qualified agritourism*.

Rural tourism itself, covering the whole of the tourism business in rural areas and associated with the rural recreational space, is the term with the broadest meaning (Kosmaczewska 2013: 37; Sharpley and Sharpley 1997). The definition of agritourism is strongly narrowing down. First of all, it is limited to agricultural lands (“true” village) and ignores the areas which are rural only in the administrative way (Raszka and Woźniak 2008: 231). Moreover, it is a form of rural tourism, which is closely associated with agriculture and an operating farm (Medlik 1995: 209; Wiatrak 2003: 9–18). Crop production and livestock breeding are one of its attractions (Gaworecki 2000: 84–85). The tourist has not only a direct, daily contact with nature, but also with the life of the village people and the possibility of participating in the work on the farm. They experience the specific home atmosphere, share meals with the hosts, and can also take part in the rural cultural and entertainment events (Majewski 2000: 8). Agritourism can take various

forms: as a permanent holiday stay on the farm; or as a specialized, more active, sports-related form of relaxation combined with: the horseback riding, cycling, Nordic walking, angling, hunting, collecting fruits of the forest, bird watching, wildlife watching, etc., and then it becomes the *qualified agritourism*.

The definition of qualified agritourism does not appear in the literature and that is why the authors considered it relevant, both from a theoretical and scientific point of view, to identify this idea. The authors adopted the following definition of qualified agritourism: *Qualified agritourism is such a form of tourism, which takes place in rural areas based on the offer of agritourism farms. It is associated with taking physical recreation using the existing natural conditions of the region, such as forests, lakes, rivers, landforms and requires from the participant physical activity and the ability to use the infrastructure (walking trails, cycling paths, horse riding tracks, playing fields, etc.), and the sports and leisure equipment (bicycle, canoe, Nordic walking, and more). It is the highest form of the tourist specialization implemented in rural areas based on the physical recreation offer of agritourism farms.*

In practice, qualified agritourism on a wider scale can develop primarily in the areas of outstanding natural and cultural assets (Kastenholz 2004), a relatively good accessibility, an adequate tourist base, sports and recreation base, and infrastructure and housing base, as well as with a large share and support of the local authorities and the promotion of the given region (MacDonald and Jolliffe 2003; *Opportunities and Threats ...* 2012). Thus, the distribution of agritourist farms is strongly associated with the natural and cultural conditions of the tourist reception area (Nilsson 2002). Tourists prefer areas with varied terrain, characterized by a high forest cover ratio and the presence of water reservoirs and watercourses. For these reasons, the location of a farm, to which the location rent is closely related, might have a crucial influence on the running of agritourism business.

A favourable factor for the development of agritourism in Poland is the structure of the Polish countryside, where a dominant position is held by small and medium-sized private farms. However, the development of rural tourism and agritourism is not equal in the regional or local terms. The spatial diversification of rural areas results from the administrative division of Poland, effective from January 1, 1999. Poland is divided into 16 voivodships (first level of the administration districts), 380 poviats (second

level), and 2479 communes (third level). Such administrative division means that the location of specific areas in a given voivodship determines (mainly due to the historical and civilization reasons and the development potential of the capital of the particular region) in some way their development opportunities and emerging social problems. In the case of tourism business in the rural areas this factor is called the farm location rent, the so-called environmental rent (Czyżewski and Henisz-Matuszczak 2004; Czarnecki 2006: 78–82; McGehee 2007).

The evaluation the tourism and recreation potential in rural areas requires a multi-dimensional analysis of natural conditions, resulting from the existence of the natural environment, as well as the socio-economic, and historical and cultural aspects (Gurung and Seeland 2008: 492). The essence of agritourism is based on the mutual relations between the incoming tourist, the existing nature and the owner of an agritourism farm exemplifying cultural characteristics of the region, living in a kind of harmony with this nature. For the tourist, however, nature constitutes a very important factor which largely determines the choice of this form of spending the leisure time. The set of natural elements of the environment (fields, forests, lakes, rivers, mountains, etc.), the elements created by humans (orchards, rural cottages, churches, crosses, wayside shrines, etc.), infrastructure of the agritourism farm and the entire village are extremely important for the potential recreation participant. Thus, running an agritourism business and its development depend on the location factors and are determined by the so-called location rent. That is why, if there are the appropriate spatial, environmental and socio-economic conditions, the qualified agritourism can become a niche product of rural areas in Poland.

MATERIAL AND METHODS

In terms of its sightseeing and natural conditions, Poland is well diversified. Tourist attractiveness of the North of the country is as a whole generated by a direct access to the Baltic Sea and the Masurian Lake District located in the North-East of the country. In the South of Poland, there are mountains: the Carpathians, Tatras, and the Holy Cross Mountains. These factors evidently create conditions for qualified tourism, and therefore they are not the subject of our research. It was therefore considered that the most

interesting research area was the Wielkopolska (Greater Poland) voivodship located in the Central-Western part of Poland and not distinctive in any special way with respect to the occurrence of natural conditions. Geographically, Wielkopolska (Greater Poland) lies within the belt of the great European plains and is part of the Wielkopolsko-Kujawska Lowland, not particularly distinguished from the surrounding areas, however, showing the characteristics favourable to the development of agritourism. Since there are no areas in Wielkopolska rich in mountain ranges, areas with access to the coastal zone or as many lakes as in other parts of the country, the rural space obviously provides the basis for the development of the specialized, higher form of rural tourism – *qualified agritourism*.

Due to the complexity of the research problem, the subject matter of study was divided into two areas with two phases of research resulting from them. The first phase of the procedure was the analysis of the diversity of the natural conditions of Wielkopolska favourable for the existence and development of rural tourism and agritourism carried out on the basis of secondary data obtained from the database of the Central Statistical Office. The objective of this phase of the study was to select a poviats in the Wielkopolska voivodship which would be the most attractive in the terms of nature. Selected natural and landscape conditions were used to carry out the valorisation of rural recreational space using the following methods: the Ward's cluster analysis and the Hellwig's synthetic development measure.

The Ward's method of cluster analysis makes it possible to connect multidimensional objects into smaller groups (Everitt 1980). It involves the use of an algorithm that groups objects (e.g. poviats) in ever-increasing sets (clusters), using some measure of similarity or distance. In the first step, the distance between the objects in the multidimensional space, i.e. the Euclidean distance is calculated. The next step is the selection of a binding or agglomeration rule, which determines when two clusters are sufficiently similar to be combined. The authors decided to choose the Ward's method, which differs from the others in the fact that for the estimation of distances between clusters, it uses the analysis of variance and is generally regarded as the most effective (Ward 1963; Sokołowski 2002). This method seeks to minimize the sum of squared deviations of any two clusters. A typical result of this type of clustering is a hierarchical tree called dendrogram,

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which intersected at the selected level, gives a specific number of groups.

The use of the Hellwig's synthetic development measure allows for the analysis and valorisation of complex phenomena, immeasurable directly by one variable. This method involves the construction of a synthetic indicator including a group of simple and measurable variables, describing the complex phenomenon studied. The construction of the Hellwig's indicator is carried out in three steps. The first one is to select simple variables that are partial indicators of the studied complex phenomenon. An important element of this step is the construction of a correlation matrix between the simple variables and the inverse matrix, and then eliminating the excessively correlated variables through the analysis of the diagonal elements of the inverse matrix. The second step includes the normalization of the values of simple variables. This involves the conversion of destimulants and nominants into stimulants, and the standardization of simple variables. The third step of the construction of the Hellwig's indicator involves determining the value of a synthetic variable by comparing each object with the model one. A model object can be represented as a vector:

$$z = (z_{01}, z_{02}, \dots, z_{0m})$$

where $z_{0j} = \max\{z_{ij}\}$ for j th simple variable.

Then the distance between each object and the model object is calculated according to the formula:

$$q_i^{(2)} = \sqrt{\frac{\sum_{j=1}^m (z_{ij} - z_{0j})^2}{m}} \quad (i = 1, 2, \dots, n)$$

The obtained values are used to calculate the Hellwig's synthetic development measure according to the formula:

$$\tilde{q}_i = 1 - \frac{q_i^{(2)}}{q_o}$$

where:

$$q_o = \bar{q}_o + 2s_o \quad \bar{q}_o = \frac{\sum_{i=1}^n q_i^{(2)}}{n} \quad s_o = \sqrt{\frac{\sum_{i=1}^n (q_i^{(2)} - \bar{q}_o)^2}{n}}$$

The Hellwig's synthetic development measure generally takes values from the range (0, 1). Higher values indicate a higher level of the studied synthetic variable (Wysocki and Lira 2003: 176).

In the second phase of the research procedure, the method of diagnostic survey was applied. It is

a technique of gathering information using a questionnaire as a research tool (Siwiński 2006a, b). The survey was conducted in order to collect primary data considering the impact of natural and sightseeing conditions on undertaking the physical recreation and the development of agritourism and rural tourism in the most attractive natural area of Wielkopolska (Międzychód powiat) selected at the first phase of the research.

Survey questionnaires were addressed to two groups of respondents. The first group consisted of the owners of agritourism farms located in the area of the Międzychód powiat, the second group were their guests. The authors decided on purposive sampling, as it was planned to carry out a personal interview with all owners of agritourism farms in the Międzychód powiat and their guests. The interview was conducted among 54 owners of agritourism farms, who agreed to participate in the research, which accounted for 83% of the entire population of agritourism farms in the Międzychód powiat. The survey among the owners of agritourism farms and among the guests of these farms was conducted by trained interviewers. Research materials collected from 248 respondents were qualified for the analysis. The number of guests surveyed resulted from the number of guests, who stayed in the surveyed farms during the data collection. The analysis of the relationship between the occurrence of sightseeing and natural conditions and undertaking the recreational activity was conducted with the use of two indicators developed by the authors: the indicator of sightseeing and natural conditions and the indicator of determinants for the physical recreation in the agritourism farms.

In order to determine the intensity of the effort undertaken by the guests of the agritourism farms, the method of measurement used in the *Paffenbarger Physical Activity Questionnaire* was applied. This questionnaire is being used to collect data about physical activity practiced throughout the year. It concerns the basic physical activity that is associated with the daily human life and the organized forms of physical recreation. It is based on self-assessment and consists of eight questions that relate specifically to the intensity of physical activity during the leisure time (Drabik 1997, after: Ainsworth et al. 1993). For the purposes of the research, the *Paffenbarger Physical Activity Questionnaire* was modified and the use was made of its substantial part. Guests of agritourism farms were asked to plot on the graph the level of the effort undertaken when practicing their chosen

forms of physical recreation during their stay on the agritourism farm.

RESULTS AND DISCUSSION

In order to identify the most attractive from a nature point of view area in the Wielkopolska voivodship, the following variables were analysed: X_1 – protected area (in % of the total area), X_2 – forest area (in % of the total area), X_3 – lake area (in % of the total area), X_4 – the share of meadows and pastures (in % of the total agricultural land), X_5 – the number of monuments of nature per 1 km². Their occurrence in high intensity in a specified area proves both the high recreational and tourism attractiveness of the given area. The relatively high number of poviats in the Wielkopolska voivodship and their significant diversification in terms of landscape values has become a reason to divide them into groups with the use of the Ward's method of cluster analysis. The resulting dendrogram was cut in half, obtaining five groups of poviats characterized by similar properties, which is shown in Figure 1.

In order to carry out the valorisation of the obtained groups with regard to their suitability for the development of rural tourism, a synthetic indicator was constructed. An average value of the particular variable in each of the examined group was calculated, and then the obtained average values in each group were standardized and summed up to give a synthetic indicator. Simple summation of the average values was

possible due to the fact that all the given variables are stimulants as far as their usefulness for the development of rural tourism and agritourism is considered. The obtained values of the synthetic indicator made it possible to rank the previously obtained groups of poviats and allowed for their valorisation in the terms of suitability for the development of agritourism and rural tourism.

The analysis showed that the Międzychód poviat located in the Western part of the Wielkopolska voivodship created a separate, distinctive group I (see Table 1). It occupies the first place in Wielkopolska mainly due to two characteristics: the lake area, which is 3.45% of the poviat area and the number of natural monuments per square kilometre (0.42). The analysis of the forest area indicator showed that the Międzychód poviat in this case is in the second place among the poviats of the Wielkopolska voivodship (44.3% of the poviat area is covered by forests). The situation is similar when it comes to the protected area which represents 67.5% of the area of the poviat. Such accumulation of the natural features of the landscape in a small area creates good conditions particularly for the preparation of the recreation base, undertaking the physical recreation and the development of rural tourism. Identification of the Międzychód poviat as an independent typological group indicates in this case the best conditions for the development of tourism in this poviat throughout Wielkopolska.

The Ward's method did not allow, however, to accurately determine which of the poviats are charac-

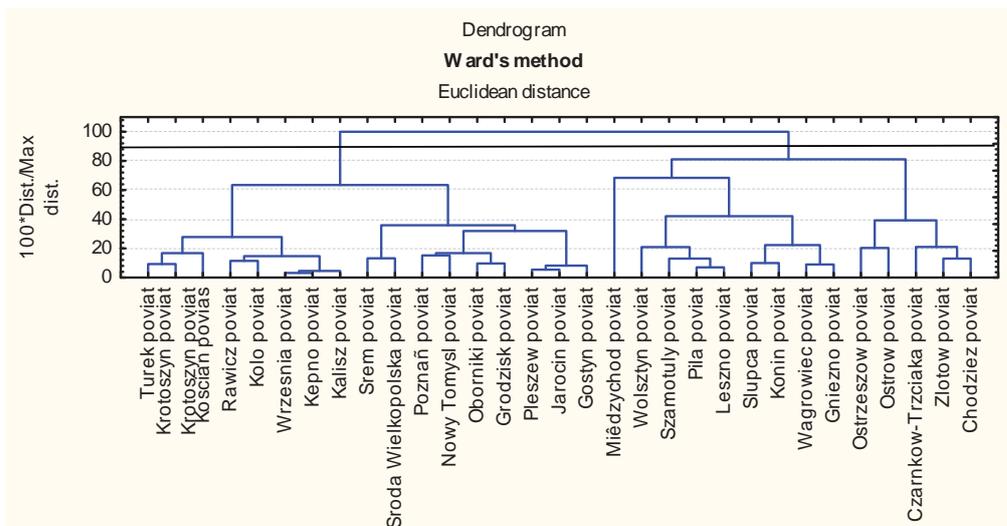


Figure 1. Dendrogram with the results of clustering by the Ward's method

Source: Own calculations

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Table 1. Typological groups of the Wielkopolska voivodship poviats according to the similarity of their sightseeing and natural conditions

Group (number of poviats in the group)	fx	X1	X2	X3	X4	X5	Sum of standardized mean values of the particular variables
I* (1 poviat)	value	67.5	44.3	3.5	9.9	0.4	9.49
II (5 poviats)	X – the average	50.4	38.3	0.5	23.6	0.1	2.97
	S – standard deviation	22.2	8.9	0.5	8.1	0.0	
	V – variability (%)	44.0	23.3	96.1	34.3	27.7	
III (8 poviats)	X – the average	34.7	22.1	1.7	12.6	0.1	0.22
	S – standard deviation	15.9	7.0	0.7	4.6	0.0	
	V – variability (%)	45.8	31.5	40.0	36.8	34.7	
IV (9 poviats)	X – the average	13.1	22.3	0.4	13.5	0.2	-0.89
	S – standard deviation	8.5	7.6	0.5	5.9	0.0	
	V – variability (%)	64.4	33.9	117.8	43.7	23.5	
V (8 poviats)	X – the average	27.7	17.5	0.1	15.0	0.1	-2.24
	S – standard deviation	16.2	4.1	0.2	2.7	0.0	
	V – variability (%)	58.6	23.3	189.5	18.0	52.7	

*As only one poviat was classified into group I, neither the average nor the other statistics can be calculated

Source: Own calculations

terized by the highest suitability for the development of agritourism and rural tourism. Since suitability is not a directly measurable variable, it was defined with the use of other variables: the protected area, the forest area, the lake area, the share of meadows and pastures in the total agricultural land and the number of natural monuments per 1 km². In order to precisely prioritize the poviats according to their

suitability for the development of tourism, a synthetic indicator of sightseeing and natural conditions was constructed according to above explained Hellwig's method. Values of this indicator for the individual poviats are shown in Table 2. At the same time, after ordering the poviats in the descending order according to the value of the Hellwig's indicator, they were divided into five groups of very high, high, medium,

Table 2. Values of the Hellwig's synthetic indicator for the poviats in the Wielkopolska voivodship

Poviat	Hellwig's synthetic indicator	Suitability for tourism development	Poviat	Hellwig's synthetic indicator	Suitability for tourism development
Międzychód	0.549	very high	Wągrowiec	0.196	low
Czarnków-Trzcianka	0.386	high	Grodzisk	0.179	low
Śrem	0.335	high	Szamotuły	0.174	low
Ostrów	0.328	high	Środa	0.163	low
Chodzież	0.320	high	Konin	0.158	low
Złotów	0.304	high	Krotoszyn	0.142	low
Wolsztyn	0.277	medium	Kalisz	0.134	low
Leszno	0.265	medium	Września	0.115	low
Słupca	0.261	medium	Jarocin	0.109	low
Poznań	0.252	medium	Gostyń	0.107	low
Nowy Tomyśl	0.250	medium	Turek	0.105	low
Ostrzeszów	0.239	medium	Kępno	0.090	very low
Piła	0.236	medium	Koło	0.089	very low
Gniezno	0.229	medium	Pleszew	0.068	very low
Kościan	0.226	medium	Rawicz	0.047	very low
Oborniki	0.222	medium			

Source: Own calculations

low and very low suitability for the development of rural tourism.

The greatest value of the Hellwig's synthetic measure of development, significantly deviating from other poviats analysed, was assigned to the Międzychód poviát, confirming, all the same, the result of the analysis carried out by the Ward's method. It is the only poviát that was placed in the group with a very high suitability for the development of rural tourism. Studies conducted within the first phase of the research procedure allowed us to determine the spatial extent for the further research, which should lead to the verification of the hypothesis adopted.

One of the assumptions of our research work was an attempt to demonstrate the relationship between the sightseeing and natural conditions and the conditions for the physical recreation occurring on agritourism farms in the analysed area. This required valorisation of sightseeing and natural conditions for each of the analysed farms. For this purpose, it was first necessary to identify those sightseeing and natural conditions influencing the given farm and to estimate the distance between the location of the farm and those conditions. This was made possible due to the survey questionnaire addressed to hosts of agritourism farms. Based on the survey results, the sightseeing and natural conditions (lakes, other water reservoirs, streams, forests, areas under legal protection) and their distance from each of the farms were precisely determined. It is obvious that the impact of sightseeing and natural conditions on the quality and form of recreation is the greater the more closely they are located to agritourism farms. Both owners and guests fully benefit from the location rent of the farm if it is situated in a closer distance to the sightseeing attractions. On the basis of research and opinions found in the literature, we decided to

group the surveyed farms into three categories of distance from the particular sightseeing and natural conditions: 0–2 km, 2–5 km, above 5 km and give them the appropriate weights: 3 for objects located at the distance of 0–2 km, 2 for objects located within 2–5 km and 1 for objects situated farther than 5 km.

Another analytical problem was to decide on the significance (to assign weights) of the particular sightseeing and natural conditions enabling the farmer to offer various forms of physical recreation. It was decided to assign significance (weights) to the individual sightseeing and natural conditions given by the hosts' respondents (Table 3).

The results obtained helped to estimate the author's synthetic indicator of sightseeing and natural conditions for all surveyed households according to the formula:

$$X_{s-n} = L \times D_i \times 4.62 + R \times D_i \times 3.52 + S \times D_i \times 3.22 + OW \times D_i \times 3.88 + F \times D_i \times 4.72 + LP \times D_i \times 4.37$$

where:

X_{s-n} = sightseeing and natural conditions

L = lake

R = river

S = stream

OW = other water reservoirs

F = forest

LP = legally protected areas

D_i = distance from the object i where

$D_i = 3$, when the distance from the object 0–2 km

$D_i = 2$, when the distance from the object 2–5 km

$D_i = 1$, when the distance from the object > 5 km

The next step of the conducted analysis helped to evaluate the conditions for physical recreation on each of the agritourism farms. On the basis of responses given by the farmers, it was possible to distinguish

Table 3. Sightseeing and natural conditions and conditions for the physical recreation favouring agritourism and undertaking physical recreation in the opinion of the agritourism farms hosts (grading scale 1–5)

Sightseeing and natural conditions	Weighted average of grades	Conditions for physical recreation	Weighted average of grades
Lake (L)	4.62	beaches, organized swimming areas, stocked streams and lakes (WR)	4.24
River (R)	3.52	walking paths (WP)	4.42
Stream (S)	3.22	horse riding trails (H)	3.97
Other water reservoirs (OW)	3.88	marked forest tourist trails (FT)	4.43
Forest (F)	4.72		
Occurrence of legal forms of nature protection (LP)	4.37		

Source: Developed on the basis of own survey research of agritourism farms hosts $n = 54$

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the forms of physical recreation, which the guests might undertake due to the occurrence of sightseeing and natural conditions. The forms of the available physical recreational activity were divided into four groups: those related to horse riding; walking, marching, running; related to water recreation and related to recreation undertaken only in the forest.

Another analytical problem concerned deciding on the significance (to assign weights) of the individual conditions for physical recreation enabling guests to undertake various forms of physical recreation. It was decided to assign significance (weights) to the particular conditions for physical recreational activity given by the hosts' respondents (Table 3).

In this way the authors' synthetic indicator of determinants for physical recreation for all surveyed households was estimated according to the formula:

$$X_{p-r} = H \times N_i \times 3.97 + WP \times N_i \times 4.42 + WR \times N_i \times 4.24 + FT \times N_i \times 4.43$$

where:

X_{p-r} = conditions for physical recreation

H = horse riding physical recreation

WP = walking, marching, running

WR = forms related to water recreation

FT = forms related to recreation undertaken in forest areas

N_i = number of occurrences in object i

In order to assess the relationship between the occurrence of sightseeing and natural conditions and the occurrence of the conditions for physical recreation, the estimated authors' indicator characterizing the sightseeing and natural conditions and the authors' indicator characterizing the conditions for physical recreational activity were used. In the first place, a scatter diagram was constructed (Figure 2). Because the distribution of the points on this diagram indicates the existence of a relationship close to linear, in order to evaluate its strength, the Pearson's correlation coefficient between the studied variables was calculated. The resulting correlation coefficient is $r = 0.86$, and it is statistically significant at an assumed probability of $p = 0.05$. This indicates a strong correlation between the occurrence of sightseeing and natural conditions and the conditions for physical recreation. Scientific reasoning, however, indicates that between the analysed variables also the causation relationship occurs.

In order to assess the impact of sightseeing and natural conditions on the conditions for physical recreation, the function of simple linear regression was estimated (Table 4). The coefficient $R^2 = 74.2\%$ indicates a good fit of the function and means that the estimated model can explain about 74% of the original variation of the dependent variable. The estimation error indicates that the average difference between

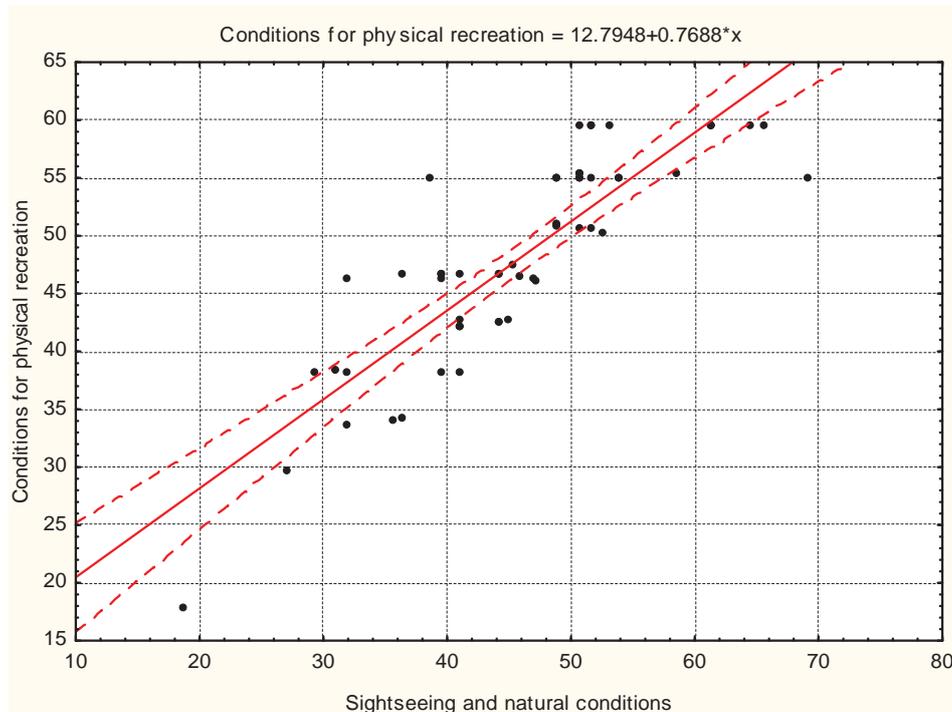


Figure 2. Scatter diagram – the indicator of conditions for physical recreation against the indicator of sightseeing and natural conditions

Table 4. Linear simple regression between two variables (the indicator of conditions for physical recreation against the indicator of sightseeing and natural conditions)

N = 54	$R = 0.86146094$ $F(1, 52) = 149.64$		$R^2 = 74.21$ $p < 0.00000$		Adjusted $R^2 = 73.71$ Standard estimation error: 4.65	
	BETA	Standard error BETA	B	Standard error B	$t(52)$	
Intercept			12.79	2.96	4.32	
X	0.86	0.07	0.77	0.06	12.23	

Source: Own calculations based on the result of a survey

the observed values of the dependent variable and the theoretical values is 4.65, which is less than 10% of the average for the dependent variable. The obtained parameters of the function and the linear model are statistically significant, as indicated by the values of t -statistics and F -statistics.

The results of the correlation and regression model, indicating a high correlation between the variables, show that in the opinion of the hosts of the analysed agritourism farms that sightseeing and nature conditions create the conditions for undertaking physical recreation. From the point of view of the research, a high correlation between the mentioned variables also means that rural areas with rich sightseeing and natural conditions, where agritourism is being developed, may constitute the area for promoting the broadly understood qualified agritourism.

In the last phase of the research, in order to assess the correlation between the level of the guests' physical effort during the stay (measured using the Paffenbarger's index), and the factors which may affect it, the Pearson's correlation coefficients were estimated between the Paffenbarger's index and the following variables: age, education, length of stay, occurrence of sightseeing and natural conditions, the number of offered forms of physical recreation, the availability of equipment (Table 5). The resulting correlation coefficients proved to be statistically significant at an assumed probability $p = 0.05$ for almost all the variables. The variables that proved to be statistically insignificant turned out to be: education,

which was characterized by a lack of variability; and the length of stay. The strongest positive correlation can be observed between Paffenbarger's index and: the number of offered forms of physical recreation, sightseeing and natural conditions, and the availability of sports equipment. A strong negative correlation exists between the Paffenbarger's index and the guests' age, which means that the older the person, the lower the level of effort while undertaking various forms of physical recreation.

In order to assess the combined effect of variables on the value of the Paffenbarger's index, the multiple linear regression function was estimated (Table 6). The method of the backward stepwise regression was used. During the first step, the function of six variables was obtained, wherein the variable 2 (education) and 3 (length of stay) turned out to be statistically insignificant. Finally, the estimated function included four variables. The adjusted coefficient $R^2 = 90.3\%$ indicates a very good fit of the function and means that the estimated model enables us to explain about 90% of the variability of the original dependent variable. The obtained function parameters and linear relationship are statistically significant, as indicated by the value of t -statistics and F -statistics.

The finally estimated function took the form:

$$y = 1.77 - 0.02 \times x_1 + 0.21 \times x_4 + 0.23 \times x_5 + 0.25 \times x_6$$

where:

y = Paffenbarger's index

x_1, x_4, x_5, x_6 = independent variables.

Table 5. Pearson's linear correlation coefficients between the Paffenbarger's index and the variables: age, education, the length of stay, the occurrence of sightseeing and natural conditions, the number of the offered forms of physical recreation, the availability of equipment ($p < 0.05$)

Dependent variable	X1 Age	X2 Education	X3 Length of stay	X4 Occurrence of sightseeing and natural conditions	X5 Number of offered forms of physical recreation	X6 Availability of sports equipment
Paffenbarger's index	-0.79	-0.07	-0.14	0.81	0.91	0.84

Source: Own calculations based on the result of a survey, $n = 248$

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Table 6. Linear regression function for four variables

	$R = 0.95112216$ $R^2 = 90.46$ Adjusted $R^2 = 90.3$ $F(4, 243) = 576.27$ $p < 0.0000$ Standard estimation error: 4.26					
	BETA	Standard error BETA	B	Standard error B	t (243)	p-value
Intercept			1.77	0.22	8.07	0.00
x1 – Age	-0.22	0.03	-0.02	0.00	-7.43	0.00
x4 – Occurrence of sightseeing and natural conditions	0.22	0.03	0.20	0.03	7.09	0.00
x5 – Number of offered forms of physical recreation	0.42	0.04	0.23	0.02	9.99	0.00
x6 – Availability of sports equipment	0.21	0.04	0.25	0.04	5.81	0.00

Source: Own calculations based on the result of a survey

On the basis of the presented results, it should be stated that undertaking of physical recreational activity and its intensity are influenced by the favourable sightseeing and natural conditions, the number of offered forms of physical recreation and the availability of sports equipment. The adjusted function parameters (BETA) indicate that the number of the offered forms of physical recreation has the strongest influence on the increase of the Paffenbarger's index.

CONCLUSIONS

Agritourism in Poland is a form of sustainable tourism which for many years has been enjoying a growing popularity. One can observe, however, some new trends in the development of agritourism. Guests of agritourism farms not only want to spend a time in the countryside, but they are also thinking about undertaking some physical activity using the available sports infrastructure. The authors of this paper called this new form of leisure a *qualified agritourism* and regard it as a form of sustainable tourism. Hence, the main aim of this paper was to identify the role of natural conditions in the development of qualified agritourism in Poland, as well as to assess the relationship between the sightseeing and natural conditions and the conditions for physical recreation occurring on agritourism farms. Empirical studies helped us to answer the research question whether the occurrence of high natural conditions influences the conditions for physical activity, which is the necessary element of the qualified agritourism. The authors' intention was also to establish the relationship between the occurrence of conditions for physical recreation in rural areas and the intensity of the physical activity undertaken by agritourists. The research hypothesis

assumed that the rural space in Poland, which is characterized by high natural conditions, complemented by the sporting infrastructure, can support the development of the rural qualified tourism.

To achieve these goals and to verify the assumed hypothesis, the authors presented their own definition of *qualified agritourism* and explained why rural areas in Poland are particularly predisposed to the development of agritourism and the qualified rural tourism. The empirical part of the research was divided into two phases. Firstly, we used some taxonomic methods to select the best area in Poland for our primary data research. Secondly, on the basis of questionnaires collected among the owners and guests of agritourism farms, we constructed two indicators: the index of sightseeing and natural conditions and the index of the determinants for physical recreation in the agritourism farms. These indicators allowed us to analyse the relationship between the occurrence of sightseeing and natural conditions and the occurrence of the conditions for physical activities. Finally, we assessed the correlation between the level of the guests' physical effort during the stay (measured by the modified Paffenbarger's index) and the factors which may affect it.

Considerations and research on the determinants favourable to undertaking physical recreation in the form of the qualified agritourism in rural areas in Poland carried out in this work allow for the drawing of a number of conclusions. Firstly, the analysis of the correlation between the occurrence of sightseeing and natural conditions and the occurrence of conditions for physical activity carried out with the use of two authors' own indices proves that in the opinion of the hosts, there exists between the sightseeing and natural conditions and the conditions for undertaking physical recreation a strong relation. Rural

areas with rich sightseeing and natural conditions where tourism develops can, therefore, become an area for promoting the broadly understood qualified agritourism. Secondly, a strong positive correlation between the Paffenbarger's index and: the number of the offered forms of physical recreation, sightseeing and natural conditions, and the availability of the sports equipment indicates that undertaking the physical recreational activity and its intensity is affected by favourable sightseeing and natural conditions, the number of the offered forms of physical recreation and the sports equipment availability. These results provide an indication that the adopted hypothesis stating that the rural space in Poland, which is characterized by specific natural conditions, complemented by sports infrastructure, can support the development of qualified agritourism, proved to be true.

The analysis of the impact of sightseeing and natural conditions of the Wielkopolska voivodship on undertaking the physical recreational activity by the guests of agritourism farms indicates the need for the specialization of tourism services in rural areas towards the qualified agritourism. In conclusion, it should be added that in addition to the sightseeing and natural conditions and suitably prepared conditions for recreation, the level and health value of the physical recreation undertaken in agritourism farms also depends on the owners of these farms. Farmers should become specialists in the field of physical culture and try to play the role of instructors and the leisure time animators. Specialized farms with an offer designed for a specific segment of the qualified agritourism and active tourists will represent an increasingly large share of the agritourism market, and the typical farms providing tourism services in rural areas will represent an increasingly smaller share. This kind of economic activity in the rural areas fits the assumption of the sustainable tourism development, since it is based on the environmental and cultural resources and activates the local people creating the possibility to gain additional incomes in the family farms.

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