COMMUNES OF LESS FAVOURED AREAS IN LANDSCAPE PARKS OF WEST POMERANIAN VOIVODESHIP

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Abstract. Functional classification of communes with less favoured areas in landscape parks in West Pomeranian Voivodeship has shown that among 10 analyzed features the biggest differences between communes were in livestock unit per 100 ha of agricultural land, density of population, proportion of non-agricultural farms in the total number of farms, as well as proportion of agricultural land and forests in the total area. Moreover, among three groups of communes, the best conditions for agricultural production were in group C which included Barwice, Dobrzany, Połczyn-Zdrój and Węgorzyno. In the rest of the studied communes, group A and B, rural tourism, agrotourism and other non--agricultural activities are preferable.

Key words: functional classification, landscape parks, less favoured areas, multifunctional development of rural areas

INTRODUCTION

In Poland less favoured areas (LFAs) constitute 57.9% of the area of agricultural land and cover 46.4% farms [Niewęgłowska 2009]. Among LFAs in Poland the following categories have been distinguished: mountainous areas, whose area constitutes 1.2% of the country's area, areas with specific impediments (foothill areas) – 3.0% of agricultural land, and lowland areas, which constitute up to 52.8% of agricultural land [Statistical Yearbook… 2008]. Most of the LFA agricultural land is situated in the area of Podlaskie Voivodeship (97.6%) and Warmian-Masurian Voivodeship (83.2%), and the least in Opole Voivodeship (23.6) and Lublin Voivodeship (43.6%). In West Pomeranian Voivodeship this area constitutes 75.2% of agricultural land [Initial analysis… 2009]. A significant feature of LFAs in Poland is their location in legally protected areas of particular natural qualities (national parks, wildlife reserves, landscape parks, areas with protected landscape) defined by the EU as

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precious wildlife sites. In Poland they cover 32.3%, and in West Pomeranian Voivodeship 21.5% of the total area [Statistical Yearbook... 2009].

In the area of landscape parks in West Pomeranian Voivodeship there are 24 communes, including 11 LFA communes.

The aim of establishing legally protected areas is conservation, protection and promotion of unique natural, landscape, historical and cultural values under conditions of sustainable development [Nature Conservation… 2004]. Among agricultural systems, integrated and ecological agriculture best corresponds with the concept of sustainable development [Grzechnik 2003, Rudnicki and Szczepański 2006]. In these areas, the prevailing form of economic-business activity may be agriculture, forestry and tourism, including agrotourism [Chmielewski and Harabin 1993, Iwicki 2000, Dubel 2002]. The basic aim of the European Union policy concerning LFAs in agriculture is maintaining their vitality as well as promoting multifunctional development [Kuyvenhoven 2004, Roszkowska-Mądra 2009].

The aim of this paper is presentation of diversity of LFA communes situated in the areas of landscape parks in West Pomeranian Voivodeship with regard to chosen diagnostics features and indicating directions of their further development.

MATERIAL AND METHODS

In the paper the following materials have been used: The General Agricultural Census 2002 [2003], Statistical Yearbook of West Pomeranian Voivodeship 2003 [2004], Statistical Yearbook of Voivodeships 2008 [2009]. In total the research included 11 LFA communes, situated in the areas of landscape parks in West Pomeranian Voivodeship. The present paper includes the set of the following diagnostics features (function parameters of compared communes):

x_1 – valorization index of agricultural productive area,
x_2 – population per 1 km^2,
x_3 – proportion of forests in the total area,
x_4 – proportion of agricultural land in the total area,
x_5 – proportion of permanent grasslands in the area of agricultural land,
x_6 – farms of 1-5 ha area of agricultural land,
x_7 – farms of 5-15 ha area of agricultural land,
x_8 – farms of over 15 ha area of agricultural land,
x_9 – non-agricultural farms,
x_{10} – livestock unit per 100 ha of agricultural land.

The above mentioned indicators became a basis for distinguishing a homogenous group of objects (communes) in the studied population with the use of Ward's hierarchical clustering method, in which intragroup variation is taken into consideration. Calculations were carried out using the program Statistica 8.

Analysis of correlation coefficients proved that the assumed features are poorly correlated ($r < 0.7$), and the variation coefficients exceed the threshold value of 10, except the indicator of evaluation of agricultural land and percentage of farms with over 15 ha area of agricultural land. However, with reference to their substantial meaning these two features were taken into consideration in the study (Table 1).

Table1.   Statistical characteristic of diagnostic features
Tabela 1. Charakterystyka statystyczna cech diagnostycznych

Diagnostic features Cecha diagnostyczna	Unit Jednostka	Statistical characteristic of the feature Charakterystyka statystyczna cechy		
		mean value wartość średnia	standard deviation odchylenie standardowe	variation coefficient współczynnik zmienności %
Valorization index of agricultural productive area Wskaźnik waloryzacji rolniczej przestrzeni produkcyjnej	points pkt.	61.4	3.4	5.5
Density of population per 1 km^2 Zaludnienie na 1 km^2	persons osoby	30.1	9.2	30.5
Proportion of forests in total area Udział lasów w powierzchni ogólnej	%	36.6	9.0	24.6
Proportion of agricultural land in total area Udział użytków rolnych w powierzchni ogólnej	%	44.1	11.1	25.2
Proportion of permanent grassland in agricultural area Udział trwałych użytków zielonych w powierzchni użytków rolnych	%	15.7	2.3	14.6
Proportion of farms with area of 1-5 ha of agricultural land in the total number of farms Udział liczbowy gospodarstw rolnych o powierzchni 1-5 ha użytków rolnych	%	52.4	7.1	13.5
Proportion of farms with area of 5-15 ha of agricultural land in the total number of farms Udział liczbowy gospodarstw rolnych o powierzchni 5-15 ha użytków rolnych	%	17.3	2.9	16.9
Proportion of farms with area of more than 15 ha of agricultural land in the total number of farms Udział liczbowy gospodarstw rolnych o powierzchni >15 ha użytków rolnych	%	21.8	5.5	6.4
Proportion of non-agricultural farms in the total number of farms Udział liczbowy gospodarstw rolnych nieprowadzących działalności rolniczej	%	37.9	9.7	25.6
Livestock unit per 100 ha of agricultural land Obsada zwierząt gospodarskich na 100 ha użytków rolnych	LU DJP	16.5	7.1	43.0

RESULTS AND DISCUSSION

The applied method of grouping objects (Fig. 1) allows for distinguishing three groups of communes, whose composition is shown in Table 2. The mean value of the feature in the group as well as the value of standard deviation in the studied population of communes, became a basis for defining an agricultural characteristic of the compared communes.

Tree diagram – Diagram drzewa
Ward's hierarchical method – Metoda Warda
Eucalidean space – Odległość euklidesowa

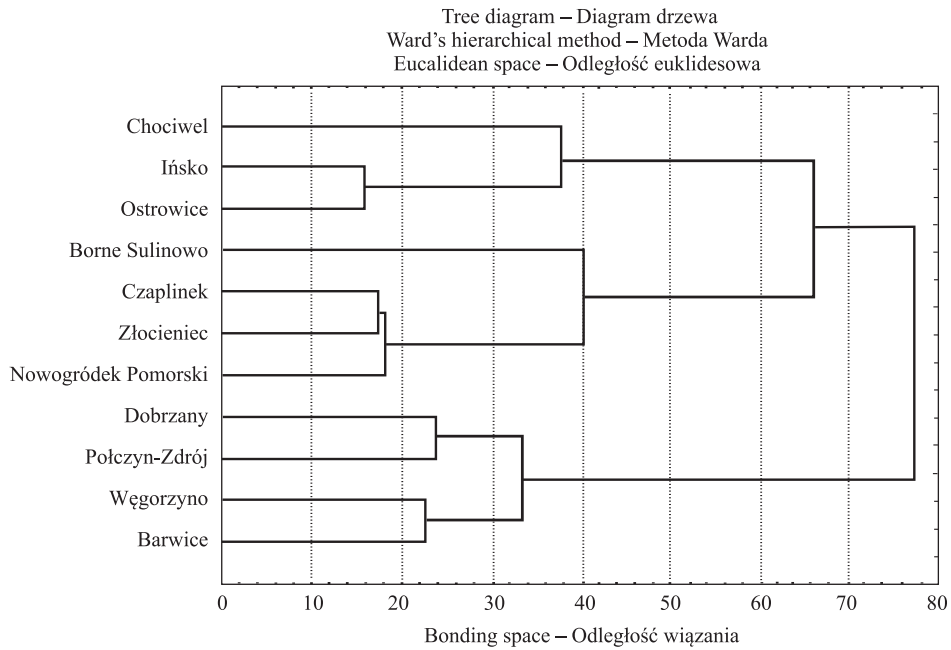Bonding space – Odległość wiązania

Fig. 1.   Dendrograph of commune clusters of less favoured areas in the areas of landscape parks
Rys. 1.   Dendrogram skupień gmin o niekorzystnych warunkach gospodarowania na obszarach
            parków krajobrazowych

Table 2. Community groups distinguished using the Ward's method
Tabela 2. Grupy gmin wyodrębnione przy użyciu metody Warda

Groups and communes – Grupy i gminy						Studied communes Badana zbiorowość gmin	
A		B		C			
Chociwel, Ińsko, Ostrowice		Borne Sulinowo, Czaplinek, Nowogródek Pomorski, Złocieniec		Dobrzany, Barwice, Połczyn-Zdrój, Węgorzyno			
x_i*	s^2_i**	x_i	s^2_i	x_i	s^2_i	x_i	s^2_i
x_1 61.3	s^2_1 1.16	x_1 60.2	s^2_1 3.92	x_1 62.6	s^2_1 4.36	x_1 61.4	s^2_1 3.43
x_2 26.0	s^2_2 10.8	x_2 26.0	s^2_2 6.48	x_2 37.3	s^2_2 7.50	x_2 30.1	s^2_2 9.22
x_3 34.3	s^2_3 5.00	x_3 44.6	s^2_3 9.09	x_3 30.3	s^2_3 5.44	x_3 36.6	s^2_3 9.03
x_4 45.5	s^2_4 3.31	x_4 33.1	s^2_4 9.34	x_4 54.0	s^2_4 4.64	x_4 44.1	s^2_4 11.09
x_5 16.0	s^2_5 0.46	x_5 16.0	s^2_5 3.59	x_5 15.1	s^2_5 2.05	x_5 15.7	s^2_5 2.33
x_6 52.3	s^2_6 5.13	x_6 57.0	s^2_6 4.55	x_6 47.8	s^2_6 8.42	x_6 52.4	s^2_6 7.06
x_7 16.0	s^2_7 4.21	x_7 17.3	s^2_7 2.44	x_7 17.8	s^2_7 2.09	x_7 17.3	s^2_7 2.91
x_8 20.7	s^2_8 2.89	x_8 19.8	s^2_8 2.63	x_8 24.8	s^2_8 8.26	x_8 21.8	s^2_8 5.46
x_9 48.9	s^2_9 7.81	x_9 37.2	s^2_9 6.37	x_9 30.4	s^2_9 6.18	x_9 37.9	s^2_9 9.73
x_{10} 11.8	s^2_{10} 2.73	x_{10} 22.6	s^2_{10} 5.88	x_{10} 13.9	s^2_{10} 7.05	x_{10} 16.5	s^2_{10} 7.15

* $x_{1\ldots10}$ – mean value of the feature – średnia wartość cechy
** $s^2_{1\ldots10}$ – value of standard deviation of the feature – wartość odchylenia standardowego cechy

Group A, which included 3 communes, has the percentage of agricultural land as well as proportion of 1-5 ha farms on the level of the mean for the studied population, however the lowest animal density and the highest proportion of non-agricultural farms (48.9%). Afforestation in this group is slightly higher than the mean for the whole population, and the population density on the level of group B. Conditions for agricultural production are not very favourable.

Group B included 4 communes. They are characterized by the highest afforestation (44.6%), and the lowest proportion of agricultural land in the total area. In the area structure of farms, there are mostly small farms (1-5 ha), and the proportion of non-agricultural farms is on the level of the mean for the given population. Communes in this group have the highest animal density and the lowest percentage of farms of over 15 ha of agricultural land. Conditions for agricultural production are moderately favourable.

Group C, which included 4 communes, is characterized by the highest proportion of agricultural land in the total area (54%), and the lowest proportion of forests (30%). The proportion of farms of over 15 ha area of agricultural land is higher compared with the mean value for the given population, and the lowest (30.4%) for non-agricultural farms. Population density is the highest compared with groups B and C. In the light of presented results, this group of communes has the most favourable conditions for agricultural development.

The conducted research proved that LFA communes, situated in the area of landscape parks in West Pomeranian Voivodeship, indicate a significant diversity of conditions for agricultural activity. These areas require reduction in the intensity of agricultural use as well as promotion of integrated, ecological agriculture and agrotourism [Dubel 2002, Grzechnik 2003, Balińska 2006, Rudnicki and Szczepański 2006]. The research of Pużyński and Dzienia [2010] confirmed that the most favorable natural and landscape conditions for the development of agrotourism are in the following communes: Barwice, Czaplinek, Dobrzany, Ińsko, Ostrowice, Węgorzyno and Złocieniec.

CONCLUSIONS

1. The greatest differences occurring in LFA communes situated in the areas of landscape parks in West Pomeranian Voivodeship concern: animal unit per 100 ha of agricultural land, population density, percentage of non-agricultural farms as well as agricultural land and forests in the total area.

2. The most favourable conditions for agricultural production have the following communes: Dobrzany, Połczyn-Zdrój, Węgorzyno and Barwice. These areas have lower afforestation, the highest proportion of agricultural land in the total area, most farms with over 15 ha area of agricultural land as well as the lowest percentage of non-agricultural farms.

3. Communes with relatively high afforestation, lower proportion of agricultural land in the total area, prevailing small farms of 1-5 ha area of agricultural land and the highest percentage of non-agricultural farms, should be oriented towards the non-agricultural activity and agrotourism.

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GMINY O NIEKORZYSTNYCH WARUNKACH GOSPODAROWANIA NA OBSZARACH PARKÓW KRAJOBRAZOWYCH WOJEWÓDZTWA ZACHODNIOPOMORSKIEGO

Streszczenie. Klasyfikacja funkcjonalna gmin o niekorzystnych warunkach gospodarowania (ONW), położonych na obszarach parków krajobrazowych województwa zachodniopomorskiego, wykazała, że spośród 10 analizowanych wskaźników największe różnice pomiędzy gminami dotyczyły obsady zwierząt gospodarskich na 100 ha użytków rolnych, gęstości zaludnienia, odsetka gospodarstw nieprowadzących działalności rolniczej oraz udziału użytków rolnych i lasów w powierzchni ogólnej. Spośród wyodrębnionych trzech grup gmin najkorzystniejsze warunki do produkcji rolniczej stwierdzono w gminach tworzących grupę C (Barwice, Dobrzany, Połczyn-Zdrój i Węgorzyno). W pozostałych gminach grupy A i B należy preferować rozwój turystyki wiejskiej i agroturystyki oraz innych form pozarolniczej działalności.

Słowa kluczowe: klasyfikacja funkcjonalna, obszary o niekorzystnych warunkach gospodarowania, parki krajobrazowe, wielofunkcyjny rozwój obszarów wiejskich