

**NATURAL CONDITIONS OF DEVELOPMENT
IN RURAL AREAS OF MIDDLE POMERANIA
– SYNTHETIC MEASUREMENT**

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Abstract. The article presents natural conditions in rural areas of Middle Pomerania. The region was delimited into four different levels of natural conditions. The research was based on the synthetic indicator.

Key words: Middle Pomerania, synthetic indicator, natural conditions

INTRODUCTION

According to Fierla [1998] natural conditions are basic but passive development factors. Profitable natural conditions occurrence does not determine neither economic structure or economic development level. Levels and directions of natural resources use depend on human activity. Moreover, Winiarski [1976] notes that diversity of environmental elements arrangement has an essential effect on arrangement of different kind of economic activity in a facilitating, restrictive or excluding way.

Natural wealths, natural forces and natural benefits determining quality of life are counted to natural resources [Jakubczyk 2002]. Instead among commonly economic useful natural resources Woś [1995] names: mineral, water, biological and soil resources. Natural resources lay down development possibilities of given areas in a multi-lateral way. Valuable mineral resources occurrence enables mine industry development and production industry and requisite infrastructure. Water reservoirs are essential elements of landscape and recreation. Water resources are useful for agricultural, municipal and industrial purposes and for energy production or as water tails. Soil resources are adapted to agricultural use, considering its physical, chemical and biological proper-

ties. Finally plants and animals preservation is a very important issue considering agriculture and tourism development.

In order to guarantee proper environment function the preservation areas system was introduced based on areas protection, species protection and individual protection [Czaja 2002]. In spite of preservation areas priceless value, economic activity restrictions cause development difficulties. Repeatedly there demands make impossible economic activity in rural areas. Considering both, social conflicts and economic activity necessity, municipalities should attempt operations to enable introduction of sustainable development. Many possibilities and solutions are suggested, Kobyliński [2001] names among others: economic mechanism, social support, ecological education and investments. Moreover, Musiał [2005] notes that nowadays difficult economic concessions are more regular, judicious and combined with future positive results valuation for restrictions or even desisting of environmental interventions.

Considering necessity of economic activity in rural areas of Middle Pomerania the main aim of this article aims at evaluating natural conditions at the local level. The research covered 65 rural and urban – rural administrative communes located in ex – provinces of Koszalin and Słupsk.

METHODOLOGY

Assessing natural conditions, complex and varied character of researched issue was considered. The natural conditions level was based on the synthetic indicator. Natural factors division into a few different correlated diagnostic features. This partition enabled estimation.

An analytical framework of the synthetic indicator comprises of three main stages, such as: selection of diagnostic features, standardization of chosen features and calculation of indicators value [Wysocki and Lira 2003].

Both essential and statistic reasons decided about diagnostic features selection. Hence complex variables were chosen. Moreover mutually strong correlated features were eliminated to dispose of duplicated information.

In order to normalize the features the unitarization was used. This method enables transformation of all diagnostic features into stimulants and conversion into comparable values.

Synthetic indicators values were based on the non – pattern method. This method amounts to the average for normalized values of diagnostic features. Finally on the basis of synthetic indicators, the average and standard declination researched units were divided into four different groups.

On the basis of essential and statistic reasons five diagnostic features were chosen, related to natural conditions of rural areas of Middle Pomerania. Those were:

- x_1 – the soil quality indicator (points),
- x_2 – the indicator of economic activity restrictions in preservation areas,
- x_3 – preservation areas (%)¹ (national parks, landscape parks, landscape preservation areas),

¹ The forest proportion was not considered, because preservation areas are mostly covered with forest.

x_4 – the natural attractiveness indicator (points),

x_5 – the reservoirs location indicator (points).

Moreover, the indicator of economic activity restrictions in preservation areas was taken as a destimulant and remaining features as stimulants. Considering complexity of the researched issue and character of diagnostic features named factors need more explanation².

Considering soil agricultural usefulness in Institute of Soil Science and Plant Cultivation in Puławy an appropriate indicator was worked out on the basis of soil natural productivity. Soil quality and usefulness are stated in points and the lower indicator value, the worse soil condition. In addition the soil quality indicator is the main component of the indicator of valorisation of agricultural productive space.

In the researched region the soil quality indicator values vary from 22.8 to 64.7 points (Fig. 1). The highest values characterized units near to Koszalin and Słupsk and the lowest in the middle – east side of the region. Considering the fact that in Poland the indicator value varies from 18 points for the least productive soil to 95 points for the most productive soil, the researched region has at disposal average soil conditions.

Considering difficulties relating to economics in preservation areas the indicator of economic activity restrictions was worked out [Heffner and Rosner 2002]. The indicator relates the preservation areas proportion to the preservation level. Three preservation forms are considered. Those are: national parks, landscape parks and landscape preservation areas³ (Table 1 and Fig. 2).

Table 1. Delimitation criteria of economic activity restrictions in preservation areas for researched units

Tabela 1. Kryteria delimitacji badanych jednostek z uwzględnieniem ograniczeń swobody gospodarczej z uwagi na obszary prawnie chronione

Form of preservation Forma ochrony przyrody	Criterion Kryterium	Validity Waga
National Parks Parki narodowe	Participation in surface of researched unit Udział w powierzchni badanej jednostki	3
Landscape Parks Parki krajobrazowe		2
Landscape preservation areas Obszary chronionego krajobrazu		1

Source: worked out on the basis of: Heffner and Rosner [2002].

Źródło: opracowano na podstawie: Heffner i Rosner [2002].

² Mineral resources were not considered. Middle Pomerania does not have at disposal this kind of resources. There are found only few resources, such as therapeutic mud and salt spring in use for health resorts [Brożek and Suszyński 2001].

³ Remaining preservation forms are also very important but usually reserves and natural monuments take up smaller space than national parks, landscape parks and landscape preservation areas.

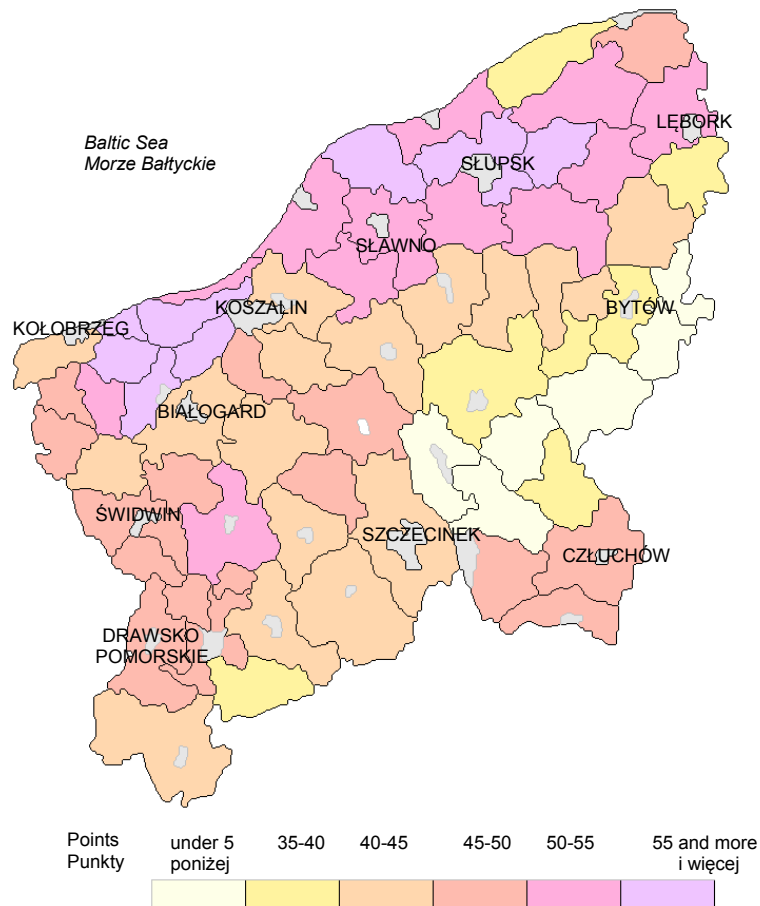


Fig. 1. Distribution of the soil quality indicator in rural areas of Middle Pomerania

Source: Institute of Soil Science and Plant Cultivation in Puławy.

Rys. 1. Przestrzenny rozkład wskaźnika jakości i przydatności rolniczej gruntów na obszarach wiejskich Pomorza Środkowego

Źródło: Instytut Uprawy Nawożenia i Gleboznawstwa w Puławach.

The indicator of economic activity restrictions is balancing the preservation areas proportion in researched areas. Hence the indicator distribution is strictly associated with location of: the Slovinski National Park⁴, Drawski Landscape Park⁵, “Słupia Valley” Landscape Park⁶ and a number of landscape preservation areas⁷. Generally on in 17

⁴ The following administrative communes: Główny, Smółdzino, Ustka, Wicko.

⁵ The following administrative communes: Barwice, Borne Sulino, Czaplina, Ostrowice, Połczyn Zdrój, Złocieniec.

⁶ The following administrative communes: Kobylnica, Dębica Kaszubska, Czarna Dąbrówka, Borzytuchom, Kołczygłowy, Bytów and Słupsk.

⁷ Among others: Mielno, Ustronie Morskie, Będzino, Szczecinek, Cewice.

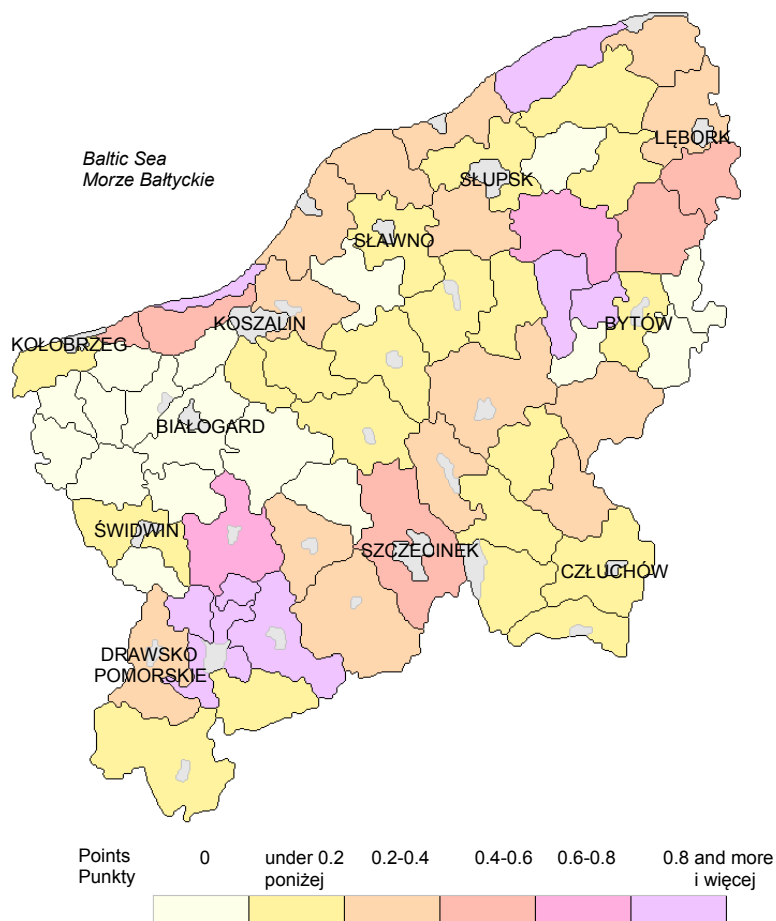


Fig. 2. Distribution of the indicator of economic activity restrictions in preservation areas in rural areas of Middle Pomerania
 Source: worked out on the basis of: Table 1, Regional Data Bank [1995-2006].

Rys. 2. Rozkład przestrzenny wskaźnika ograniczeń działalności gospodarczej z uwagi na obszary prawnie chronione na obszarach wiejskich Pomorza Środkowego
 Źródło: obliczono na podstawie: tabeli 1, Banku Danych Regionalnych GUS [1995-2006].

researched units (26%) no essential economic activity restrictions related to named preservation areas are in force. The largest group of this kind of units is located in middle – western part of the region. Moreover, low indicator value can result from both lack of preservation areas and occurrence of other preservation forms.

The natural attractiveness indicator is a complement for features describing natural conditions of Middle Pomerania (Fig. 3 and Table 2). The indicator considers information about: reserves, natural monuments and health resorts. Health resorts function on the basis of therapeutic mud resources, salt spring resources and specific climate conditions.

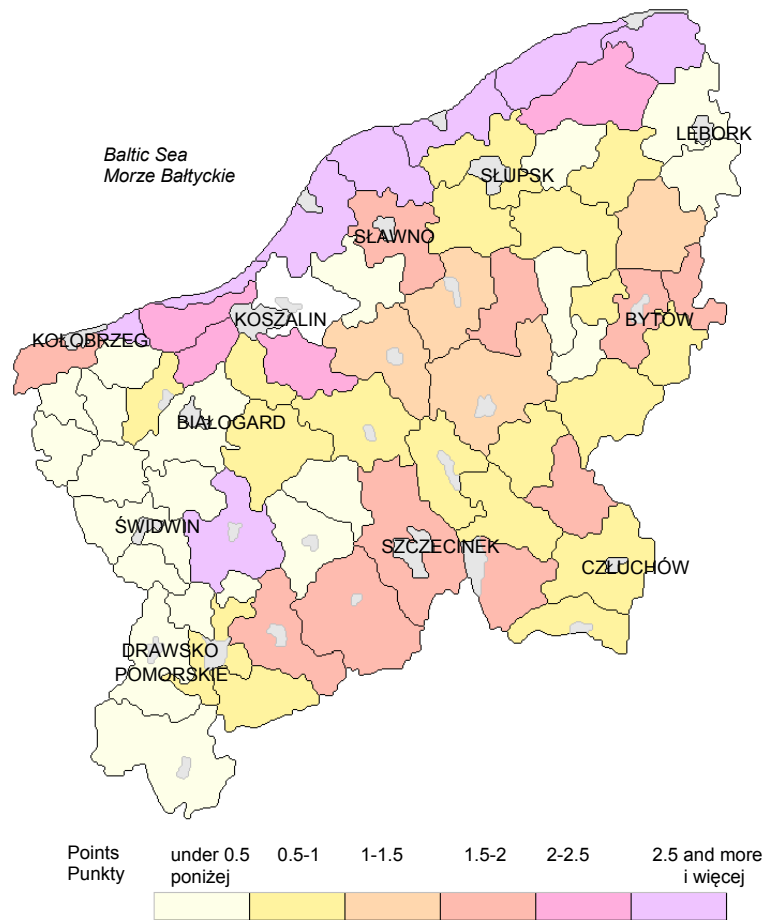


Fig. 3. Distribution of the natural attractiveness indicator in rural areas of Middle Pomerania

Source: worked out on the basis of: Table 2, Regional Data Bank [1995-2006].

Rys. 3. Rozkład przestrzenny wartości wskaźnika atrakcyjności, wynikającej z warunków naturalnych na obszarach wiejskich Pomorza Środkowego
Źródło: obliczono na podstawie: tabeli 2, Banku Danych Regionalnych GUS [1995-2006].

Health resorts are very important development factors attracting both patients and tourists. In Middle Pomerania there are health resorts in the following administrative communes: Łeba, Ustka, Ustronie Morskie, Mielno, Darłowo, Postomino and Połczyn Zdrój. It is verified by the natural attractiveness indicator distribution. In addition each researched unit obtained indicator value higher than zero. It means that in the researched region areas without any natural attraction do not occur. The largest group with low indicator value is located in western part of the region. Considering unique nature advantages there are numerous reserves and natural monuments.

On the basis of three types of water reservoirs the classification of rural areas of Middle Pomerania was made considering reservoirs location (Table 3). According to

Table 2. Delimitation criteria of the natural attractiveness indicator for the researched units
Tabela 2. Kryteria delimitacji badanych jednostek z uwagi na atrakcyjność wynikającą z warunków przyrodniczych

Objects Obiekty	Criteria Kryteria	Points Punkty
Health resorts Uzdrowiska	occurrence in the administrative commune występowanie w gminie	3
Reserves Rezerwy	under 50 ha poniżej 50 ha powierzchni	0.5
	50-100 ha	1
	100 and more ha 100 i więcej ha	1.5
Natural monuments Pomniki przyrody	the administrative communes with maximal number of natural monuments gmina o maksymalnej liczbie pomników przyrody	1
	other communes pozostałe gminy	ratio number of natural monuments in the commune to number of natural monuments in the commune with maximal number of this objects liczba pomników przyrody w gminie w stosunku do liczebności tychże obiektów w gminie o maksymalnej ich liczbie

Source: own calculation.
Źródło: opracowanie własne.

Table 3. Delimitation criteria of the reservoirs location indicator for researched units
Tabela 3. Kryteria delimitacji badanych jednostek z uwagi na położenie względem zbiorników wodnych

Types of reservoirs Typy zbiorników wodnych			Points Punkty
sea morze	lakes more than 4 km ² area jeziora powyżej 4 km ² powierzchni	rivers more than 50 km long rzeki powyżej 50 km długości	
+	+	+	7
+	+	-	6
+	-	+	5
+	-	-	4
-	+	+	3
-	+	-	2
-	-	+	1

Source: own calculation.
Źródło: opracowanie własne.

assumptions the reservoirs location indicator distribution covers with landscape types in Middle Pomerania (Fig. 4). In the northern – the most valuable – part there is the seaside with numerous rivers running to Baltic Sea. Lake areas form another highly evaluated group. In addition only 11 of the researched units (17%) do not have access to any larger water reservoirs considered in the research.

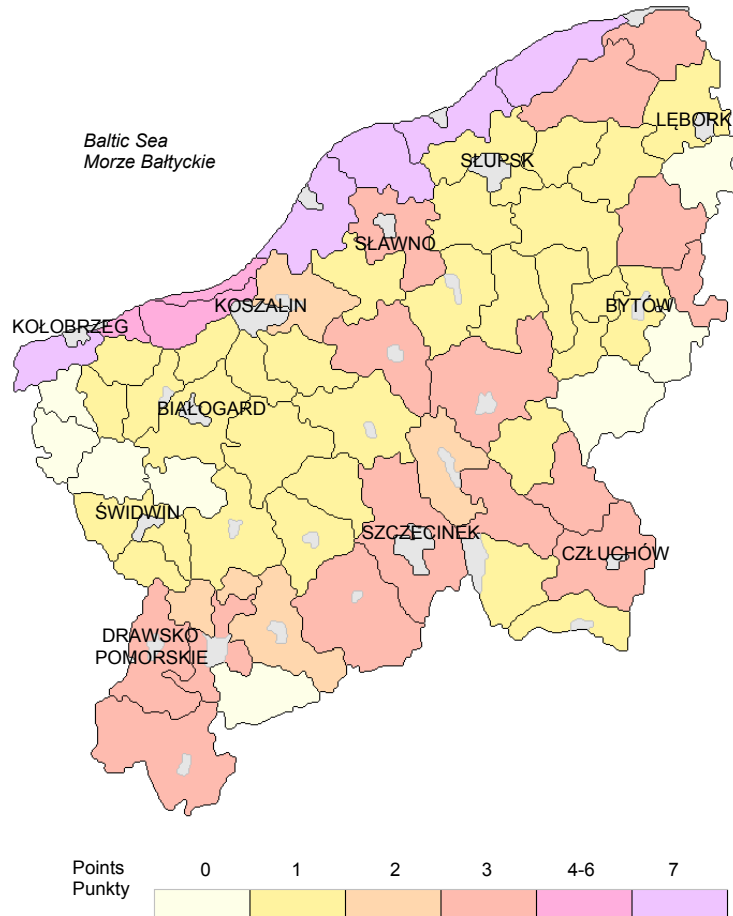


Fig. 4. Distribution of the reservoirs location indicator in rural areas of Middle Pomerania

Source: own calculation on the basis of Table 3.

Rys. 4. Rozkład przestrzenny wartości wskaźnika położenia względem zbiorników wodnych na obszarach wiejskich Pomorza Środkowego
Źródło: obliczenia własne na podstawie tabeli 3.

RESEARCH RESULTS

On the basis of the synthetic indicator value, the average and the statistic declination researched administrative communes were divided into four typological classes presenting different level of the research issue:

- class I – very high,
- class II – over middle,
- class III – below middle,
- class IV – very low.

Table 4 contains indicators relating to both classes and the whole region. Figure 5 presents results distribution relating to the level of natural conditions in rural areas of Middle Pomerania.

Table 4. Indicators for natural conditions in rural areas of Middle Pomerania

Tabela 4. Wskaźniki charakteryzujące warunki naturalne obszarów wiejskich Pomorza Środkowego

Specification Wyszczególnienie	Class I Klasa I	Class II Klasa II	Class III Klasa III	Class IV Klasa IV	Total Ogółem
Number of units Liczba jednostek	9	17	34	5	65
Participation of units (%) Udział jednostek (%)	13.85	26.15	52.31	7.69	100.00
Average value of the soil quality indicator (points) Średnia wartość wskaźnika jakości i przydatności rolniczej gruntów (pkt.)	52.86	46.99	45.76	31.48	45.96
Average value of the indicator of economic activity restrictions in preservation areas (points) Średnia wartość wskaźnika ograniczeń gospodar- czych (pkt.)	0.40	0.49	0.16	0.08	0.27
Preservation areas (%) Obszary cenne przyrodniczo (% powierzchni gminy)	29.68	33.82	11.61	11.23	20.73
Average values of the natural attractiveness indicator (points) Średnia wartość wskaźnika atrakcji wynikającego z warunków naturalnych (pkt.)	3.63	1.45	0.56	0.36	1.21
Average values of the reservoirs location indicator (points) Średnia wartość wskaźnika położenia względem zbiorników wodnych (pkt.)	5.33	2.59	1.18	0.40	2.06
Average values of the synthetic indicator (points) Średnia wartość wskaźnika syntetycznego (pkt.)	0.663	0.462	0.369	0.273	0.427

Source: own calculation.
Źródło: obliczenia własne.

There are almost 14% researched units in first class. First of all those are seaside communes and Połczyn Zdrój – the commune located in lake part of the region. Those areas have at disposal profitable natural conditions with large preservation areas proportion, health resorts, good soil conditions and a number of water reservoirs.

In second class particular indicator values are slightly worse than in the class I. There are 26% researched units in second class. Those are administrative communes with quite large preservation areas proportion. In second class soil conditions are generally good but worse than in first class. In addition there are a number of rivers and big lakes in this class. In second class areas are naturally attractive with clean environment.

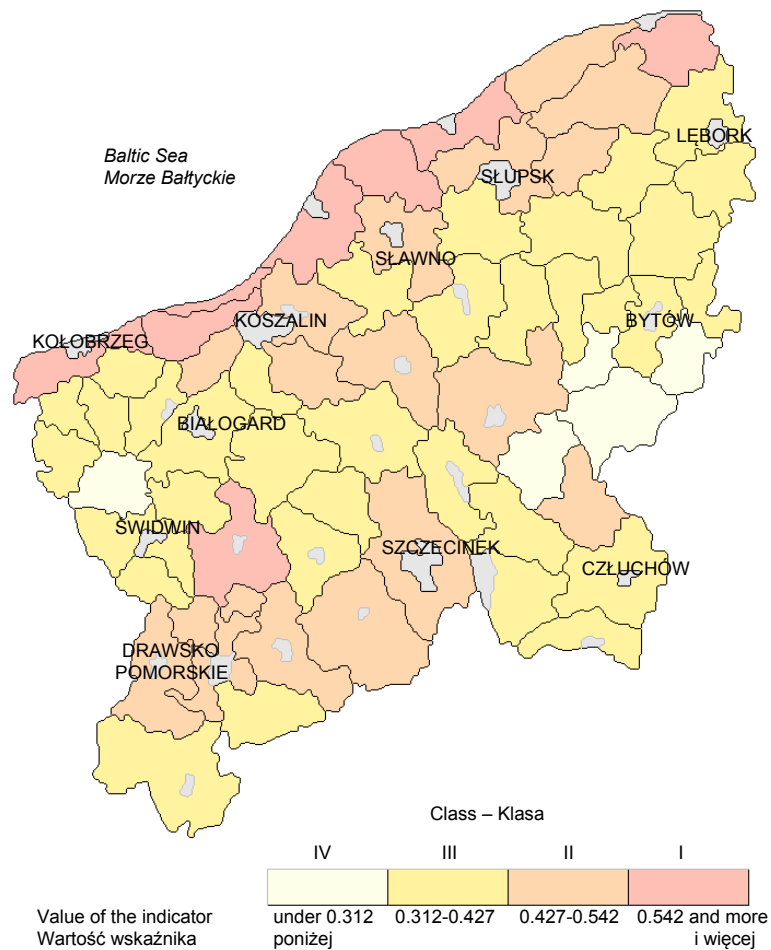


Fig. 5. Level of natural conditions in rural areas of Middle Pomerania – synthetic measurement
Source: own calculation.

Rys. 5. Poziom warunków naturalnych obszarów wiejskich Pomorza Środkowego – pomiar syntetyczny
Źródło: obliczenia własne.

Third class is the most numerous concentrating 52% of the researched units. In this class only soil conditions do not differ much from first and second classes. There are definitely fewer preservation areas and large water reservoirs. There is lack of therapeutic mud resources, salt spring resources and specific climate conditions, which has an important effect on units attractiveness in this class.

Finally the lowest level involves researched units in fourth class, including 5 rural communes. In this class all researched indicators reach the lowest values. It means that researched communes are characterized by the lowest soil quality, the lowest preservation areas partition (and the lowest value of the indicator of economic activity restrictions), the fewest large water reservoirs. Considering natural conditions in fourth class it must be stated that they are the least attractive areas in the researched region.

CONCLUSIONS

Doubtless occurrence of large beaches and resorts, clean environment and diversified beautiful landscape have an effect on Middle Pomerania attractiveness. The most attractive areas are located in northern – seaside part and middle – southern – lake part of the region.

In rural areas of Middle Pomerania 40% of the researched communes (first and second class) have at disposal above average natural conditions. Those areas are characterized by:

- quite good soil conditions (48 points average),
- large preservation areas proportion (over 33%),
- great attractiveness resulting from natural conditions (2.3 points),
- occurrence of numerous and diversified water reservoirs (3.5 points of the reservoirs location indicator).

However, over 60% of the researched communes are characterized by weaker than average natural conditions.

Natural conditions create a lot of developmental possibilities. First of all natural conditions are the appropriate base for tourism, ecological agriculture and forestry. Hence environmental care should be taken of an integral development element in rural areas of Middle Pomerania.

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PRZYRODNICZE UWARUNKOWANIA ROZWOJU OBSZARÓW WIEJSKICH POMORZA ŚRODKOWEGO – POMIAR SYNTETYCZNY

Streszczenie. W artykule zaprezentowano warunki przyrodnicze obszarów wiejskich Pomorza Środkowego. W analizie uwzględniono następujące naturalne czynniki rozwoju: jakość i przydatność rolnicza gruntów, obszary prawnie chronione (oraz ograniczenia działalności gospodarczej na tychże terenach), atrakcyjność wynikająca z warunków naturalnych oraz położenie względem zbiorników wodnych. Badaniami objęto gminy wiejskie i miejsko-wiejskie. Obliczenia przeprowadzono w oparciu o wskaźnik syntetyczny, w wyniku czego badane jednostki zostały podzielone na cztery klasy reprezentujące różny poziom uwarunkowań naturalnych. Ogólnie rzecz ujmując, na obszarach wiejskich Pomorza Środkowego 40% badanych gmin dysponuje dobrymi warunkami naturalnymi, co stanowi odpowiednią bazę zarówno dla rozwoju zarówno turystyki, jak i innych form działalności gospodarczej.

Słowa kluczowe: Pomorze Środkowe, miernik syntetyczny, warunki naturalne

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