

## SYNERGISM IN THE POLISH LANDSCAPE

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*The application of synergy for the solution to the problem of land use in areas of complex environmental conditions and diverse topographic profiles, based on economic indexes of the modern agriculture, leads to an ordered landscape structure and more aesthetic space arrangement. Quantitative and qualitative growth in agricultural production can be achieved as a result of ordering agrarian structures. Ordered agrarian structures create in turn ordered landscape structures. One must stress that the natural landscape as well as an aesthetically appropriate cultural landscape can largely result from correctly selected forms of management in agriculture. This study is supposed to create a tool to assist the process of synergic landscape ordering, according to the rules of rational economy and environmental protection.*

### Introduction

The co-ordinated effect of various landscape elements guarantees a greater potential for reaching spatial order than separate effects of each of the elements. The order in natural space, which can still be observed in primeval landscapes, whose theme is "the good of the whole", does not have any equivalent in anthropogenic space. In order to maintain order in space, it is necessary to combine separate elements so as to ensure that such a combination represents something more than just a result of ordinary summation. Such a combination is called synergy. In other words, synergy is supposed to consolidate parts into one whole in order to obtain values that cannot be achieved while these elements remain separate. According to Kotarbinski (1987), "Synergy is when and only when acting entities that cooperate with each other achieve more than when acting separately".

Landscape can be received subjectively. There are many definitions of landscape. More and more frequently we come across a tendency to present the landscape as a synthesis of elements of nature and human activity that remain in a mutual relation to and interaction with one another. The man is a co-author of the landscape, and the landscape in which the man lives affects their consciousness, shapes their personality, culture, history.

When we say "landscape", we mean aesthetics, beauty, identity of the place, finally the relation between the man and their "little homeland".

### Landscape assessment and shaping methods

The studies concerning landscape assessment propose various research methods and techniques. They differ in the approach to research, degree of detail, interpretation of the results as well as the selected classification scheme. A common feature of all the methods is the analysis of different space elements, and the methods most often lead to separating specific landscape types or classes.

The most common methods include:

*Sohnen method* – based on a score-based assessment of the natural value of different environment elements (assuming that the landscape value depends on the natural value of its components). Special focus is put on those elements that are close to natural, and should be left unchanged, or even protected against damage or depreciation, while conducting arrangement and agricultural works.

*Impressions curve method* – one of the methods based on the assessment of aesthetic and visual landscape values. This method was described and applied by Wejchert (Wejchert K., 1974) to the assessment of urbanized (urban) spaces. It graphically shows the tension of emotional impressions and sensations experienced by the observer while moving in time and space.

*Natural area elements method (NAE)* – developed by Cymerman and Koc (Cymerman R., Koc J., 1990), based on the assumption that the more natural or close to natural (almost natural) elements in the area, the higher the values. The WNET method makes use of the information contained in available materials, mostly on topographic maps, land register records as well as other documents.

*Photographs method* – this method was developed by Cymerman and Hopfer (Cymerman R., Hopfer A., 1988). Landscape is assessed on the basis of the image recorded on the photograph. The assessing person divides the photograph into segments, analyses their content and assigns scores.

Stages:

1. Select positions from which the photographs are going to be taken. These should preferably be vertices of the square grid (1 km long side), fitted into the assessed area. Square sides should be running along meridians and parallels of latitude.
2. Take photographs from the selected positions. It is assumed that four photographs are taken in four main directions from each position, using a camera with at least 90° angle of view. Each photograph will represent ca. 1/4 of the image viewable from the position.
3. Assess the landscape shown on the photograph. The photograph shall be divided with a vertical line (through the middle) into two parts (segments), and landscape value scores shall be assigned for each segment. The range of the area assessed on each photograph should reach the parallel line to the positions line, running at the distance of ca. 0.5 km, namely cover ca. 25 hectares.
4. Different segment scores shall be transferred to the squares grid to be put on the assessed area map, and regions of different landscape value shall be marked (grid-based method).

In the study, anthropogenic landscape was assessed with the area significance index method (ASI), developed by U. Litwin [1].

This method values the area depending on its basic functions: agricultural, non-agricultural, recreational. This index represents the “value” of each of the separated areas

and types of activity, according to the adopted set of attributes. Landscape valuation using indexes can be helpful in synergic ordering of landscape structures, in line with the principles of rational management and environmental protection.

### Description of the study area

The research was conducted in the Mszana Valley. The Mszana region combines three districts: Mszana Dolna, Dobra, Niedźwiedź, being located in the north-western part of the Małopolskie Province. The region's total area is 35 481 hectares. The region is quite weakly populated. The density of population is 84.6 people per km<sup>2</sup> in the region, compared to 128.4 people per km<sup>2</sup> for the province. The leading function

of the study area is agriculture and forestry. This is due to the fact that arable land and forests are predominant in the land use structure. The agricultural character of the Mszana region is also proved by the ratio of arable land per 1 person.

The Mszana region is geographically located in the Beskid Wyspowy mountain range. It partly lies within the Gorczański National Park. It also embraces (in the district of Niedźwiedź) protected landscape areas, and forests almost entirely classified in the protected forest category. Owing to its mountain location and non-degraded natural environment, the study region has tourist and recreational values.

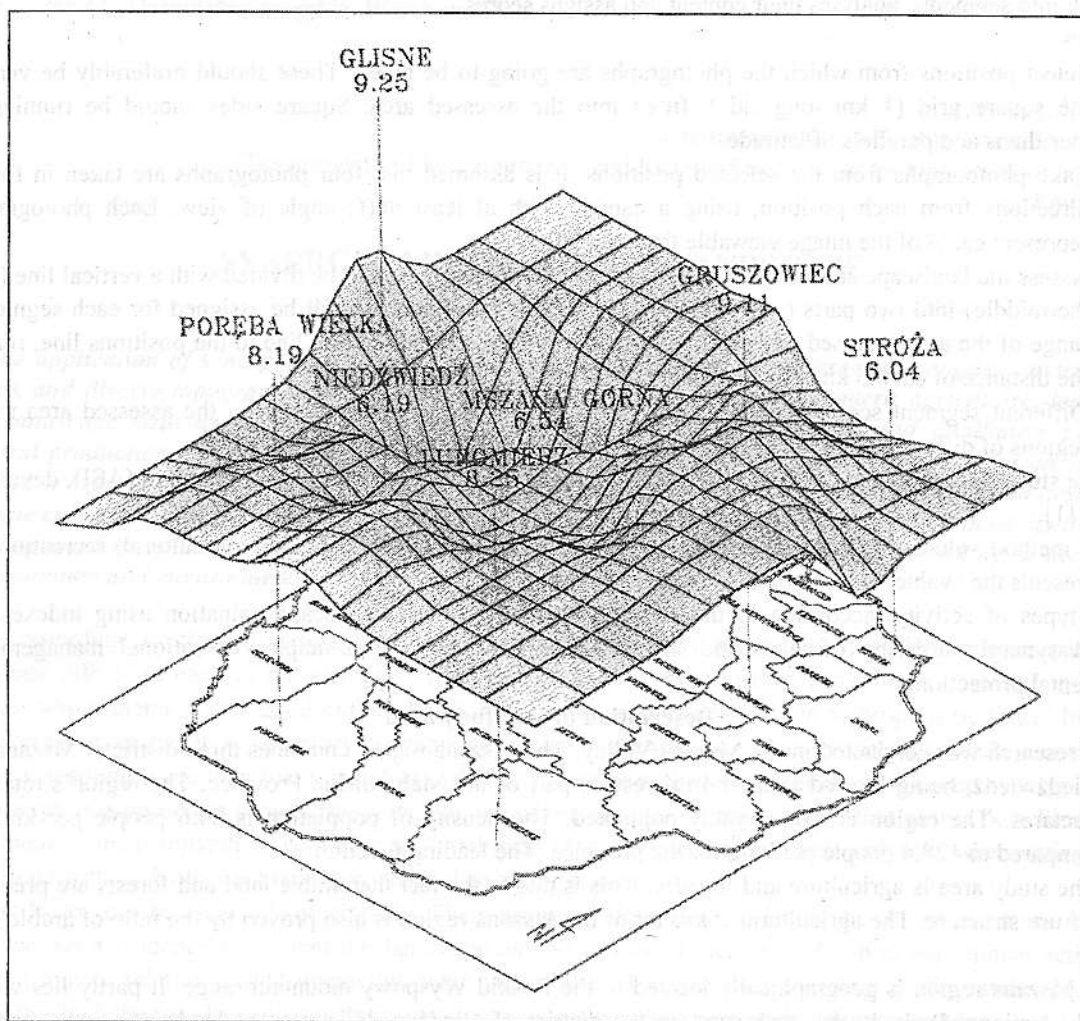
The Mszana Valley is part of the Beskid region, and thus it is representative in terms of the economy, landscape planning and environmental protection in the mountains.

#### Study method.

The study utilizes a broad representation of attributes describing the rural spatial structure. A set of attributes was created for the arable land structure, rural settlement, selected parameters describing the natural environment. The set of attributes was subject to statistical analysis in order to determine any correlations between the attributes. It had to be ensured that the separated general and specific types of the agricultural landscape and the types of the settlement landscape are characterized by similar area conditions, land use structure, demographic relations as well as the level of agricultural production. The purpose was to describe and assess the spatial diversification of rural landscapes in the Mszana region [1]

This study makes use of two spatial typologies: agricultural landscape typology and settlement landscape typology. The first typology refers to agricultural landscapes, being based on the analysis of land use systems in the Mszana region. Agricultural landscape types were determined in two stages. First, proportions of the area were examined for the three land groups shown in the statistics (arable land, forest, other land), and the so-called general types were separated; later, the relation of the area was studied for each land group (arable land, orchards, permanent greens), and the so-called specific agricultural landscape types were distinguished.

As a result of this procedure, the so-called general and specific types of agricultural landscape were distinguished. Statistical characteristics, including average values, standard deviation and coefficient of variation, were calculated for each type and for the whole population.



Fot.1 Mszana Valley – spatial distribution of WIT3 index after smoothing (recreation function).

The second typology was concerned with settlement landscapes. The attribute describing the degree of rural building concentration was used in the study. Taking account of the class intervals in this attribute, the Mszana region was divided into sets of villages similar to each other in terms of physiognomy of rural settlement. The separated village types were characterized against the set of selected attributes describing values of the natural environment and settlement. Average values, standard deviations and coefficients of variation were calculated for the separated types and for the whole population. These allowed the differences between the different types to be captured. They also constituted the basis for assessing whether the adopted typology was appropriate.

The applied typologies were helpful in calculating area significance indexes. These indexes can be used to assess the "value" of each of the separated areas, according to the adopted set of attributes. The calculated ASI values can be used to try to evaluate the landscape of the Mszana Valley.

Apart from the typology of agricultural landscapes, a spatial typology of settlement landscapes was analysed and developed. The basis for this typology was the attribute describing the degree of village concentration. It describes the degree to which the general rural area is filled with buildings, in other words it tells us what part of the total area is the area of buildings.

The Mszana Region was divided by the degree of village concentration, by means of grouping values of this attribute into four classes. These separated types of villages were then characterised according to the input set of attributes describing natural conditions and settlement [1].

### Summary

The presented characteristics and assessment of spatial landscape diversification lead to a conclusion that multifunctional agricultural landscapes are predominant in the Mszana Valley. Three main types of agricultural landscapes were distinguished: agricultural landscape with forests, balanced agricultural-forest landscape, forest landscape with arable land.

Specific types of agricultural landscapes were also separated, giving consideration to the proportion of arable land, permanent greens and orchards.

The rural landscape is particularly affected by the spatial layout of buildings in rural settlements. One should note that agriculture is an inseparable element of landscape in the study region. One may also observe that the percentage of agricultural land in the total area and the percentage of arable land in agricultural land is decreasing as the altitude above sea level grows. High altitude above sea level and specific relief also determine the degree and shape of building development.

### Literature

1. Litwin U., Synergiczne uporządkowanie struktur krajobrazowych na przykładzie Kotliny Mszańskiej. Kraków 1997
2. Tołwiński T., Urbanistyka. Warszawa 1963