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# The Role of Culture in the Sustainable Development of Voivodships in Poland

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**Abstract:** The purpose of the study is an attempt to assess the importance of culture for the sustainable development of Polish voivodships. For the purpose of this research, a taxonomic method was used to distinguish areas similar to one another in terms of the characteristics examined and to group them into regions with similar development conditions. On the basis of the analysis of the source data and the set of synthetic indicators of sustainable development it can be stated with certainty that cultural activities (in terms of institutional approach) taken in Polish voivodships are important for the level of their sustainability.

***Keywords:*** culture, sustainable development, voivodships, taxonomic method

***JEL codes:*** Q01, R58

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## 1. Introduction

The understanding of the unique role of culture and cultural heritage in the modern world is becoming widespread because of the recognition that culture is a capital without which development planning – including sustainable development, can mean making decisions that are not accepted by local communities. The impact of the culture on development appears in the international documents, national strategies and strategies of individual cities and communities. In the National Strategy for Culture Development for the years 2004-2013, culture has been

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recognized as a basic development factor and eleven areas of its influence on social development have been identified. The culture:

1. creates the intellectual potential of regions by building human capital,
2. creates a society that is consciously guided by ethical standards and open - by popularizing cultural diversity,
3. counteracts social pathologies,
4. is the bond of social integration,
5. is the content of national identity,
6. cultivates local ties,
7. is the basis for establishing cooperation and communication between people,
8. implements the principles of gender equality, racial equality and social solidarity,
9. helps to restore impaired and disabled people to social and professional life (e.g. cultural therapy, change of mentality and overcoming prejudices),
10. reduces the disproportions of personal development of citizens,
11. it is one of the forms and dimensions of social promotion (The National Strategy for Cultural Development, 2004: 7).

The description of mutual relations between culture and other aspects of sustainable development causes many difficulties, as the ambiguity of the definition of culture, problems of its quantification, and in particular its psychological, institutional, political and geographical aspects, makes culture a difficult but indispensable research area for sustainable development analysis in the context of local development.

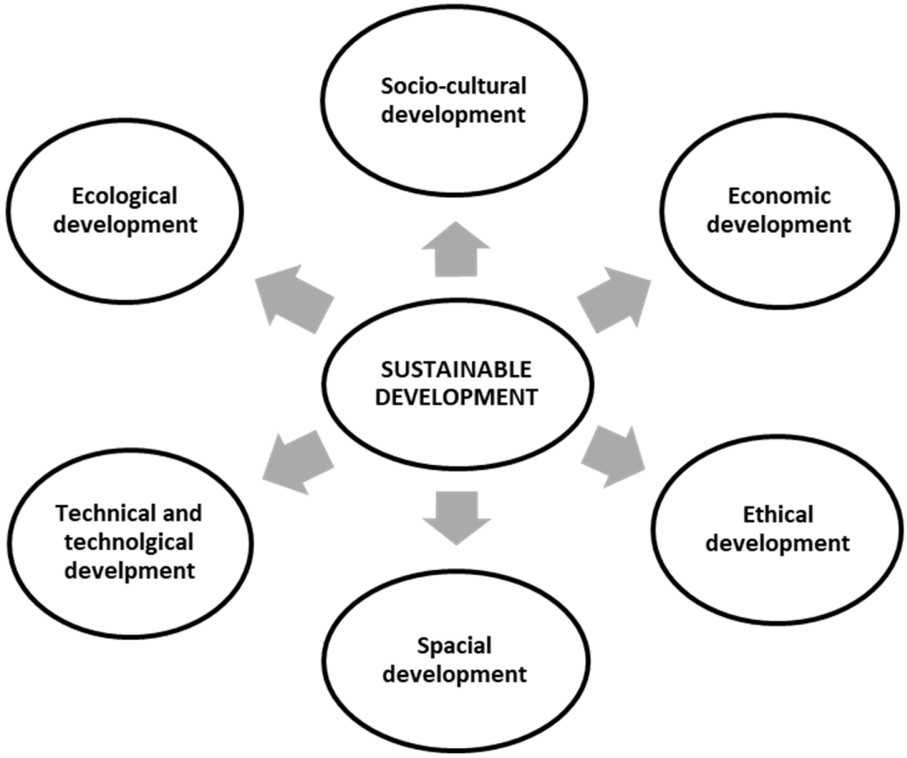
The aim of the study is an attempt of evaluation of the importance of culture for Poland's sustainable development. A detailed description of the research procedure was included in section 3 below.

## 2. The culture as a component of sustainable development

The concept of sustainable development is classically understood as a triad based on an environmental, economical and social aspect. However, in source literature it is often pointed out there is a need for more detailed approach to the factors crucial for development, emphasizing a holistic approach that includes the issues of the natural environment, economic, social, cultural,

spatial, technological and ethical (Figure 1). Such a thinking allows us to broaden the proposal of the set of indicators for monitoring sustainable development with cultural indicators[1]. Indeed it is important to define the place that culture takes in integrating different development factors. It is particularly important for local development, contributing to social cohesion, local identity and the process of shaping civil society.

**Figure 1. Systemic approach to sustainable development**



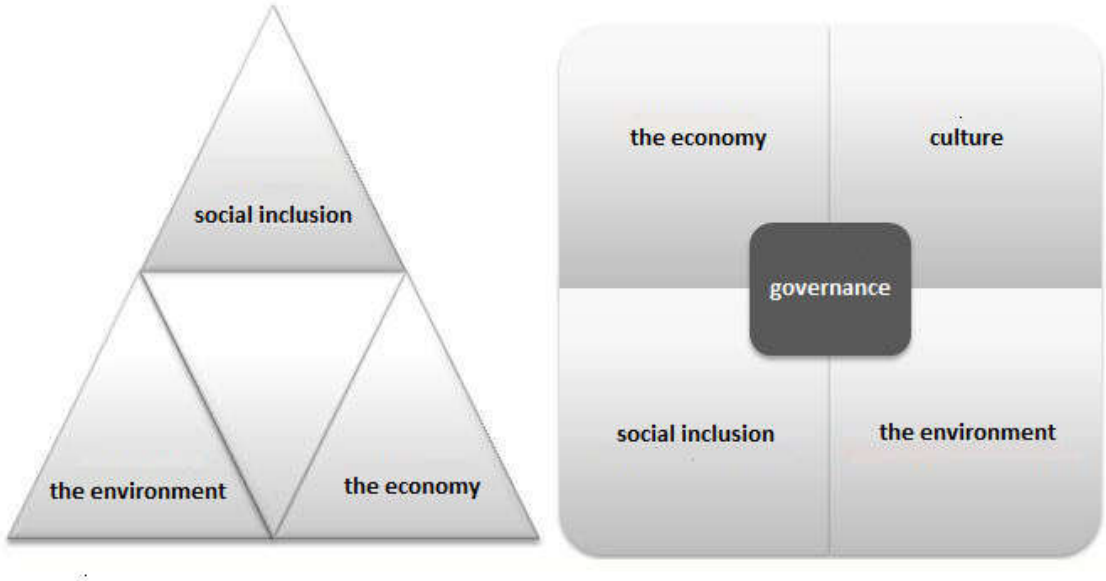

Source: Author's own elaboration based on: Siemiński, 2008: 178.

Neglection - and thus weakening the cultural area (especially in areas affected by conflicts or rapid economic changes), causes communities to be more exposed to the negative processes of disintegration of social bonds and existing so far systems of values, that can lead to creation of unfavorable conditions of social order functioning.

[1] In the important for sustainable development studies publication, *Wskaźniki zrównoważonego rozwoju Polski 2015*, published by GUS in Katowice (2015) a set of 101 indicators has been selected based on the assumptions and objectives related to the sustainability challenges written in the national strategy documents directed by the assessment of the importance of the indicator for the sustainable development of the country, basically ignoring direct indicators connected directly with culture.

When looking at the different approaches to the role and place that culture plays in development (Figure 2), one can point the presence of different perspectives. The mainstream economics perspective is based on the neo-classical theory of economics, where market solutions are the foundation of effective economic activity. In another approach, the point of reference is not the market, but socio-economic development, that allows to grasp the relationship of culture with economy and broader - social change. The determinant of this approach is the assumption that *the culture is a basic resource - a factor and a mechanism for socio-economic development, and especially in times of crisis in its area, it is necessary to seek inspiration, opportunities and innovative ways of taking actions, because it broadens our cognitive perspectives, facilitates communication and defines the situation, and thus - co-operation* (Hausner et al., 2013: 13-17).

**Figure 2. Proposition of a new perspective look on the role of culture in development - from the triangle to the square of sustainable development**




Source: Author's own elaboration based on: Pascual 2009: 38.

The new concept places the sphere of culture between understanding it as an autotelic activity and essentializing it in terms of economic development and its contribution to gross domestic product. This new paradigm seems to be perceiving culture as a "lever" of social development in very diverse dimensions - from the building of competencies, through the creation of local bonds and support for the development of identity to the creation of social cohesion (Szultka and Zbieranek, 2012: 7).

It is therefore becoming accepted according to Szomburg (2002: 10), that *the culture in a broad sense is the subsoil, from which all the most important elements of modern economic and development success are emerging: high qualifications, creativity, business ethic and cooperation ability*.

Murzyn-Kupisz (2012: 82) by analyzing the dimensions of cultural impact on socio-economic development underlined clearly the role in which the cultural aspects of local culture play in the transformation processes, and pointed at the opportunities of the development of economic initiatives in the sphere of widely known culture. Synthetic description of the use of cultural resources is provided in Table 1.

**Table. 1. Planes of cultural impact on socio-economic development**

| Impact planes | Characteristic |
|---|---|
| 1. Economic effect | - income generated directly through activities to preserve, share and interpret cultural heritage,<br>- multiplier effects, including maintenance and jobs creation,<br>- supporting structural change in the economy,<br>- tax revenues of the public sector,<br>- real estate market |
| 2. Image and branding of a location | - among the tourists,<br>- among the entrepreneurs and investors,<br>- among the inhabitants |
| 3. The level and quality of life of the inhabitants | - satisfying cultural needs,<br>- satisfying the recreational needs,<br>- aesthetics of space,<br>- impact on social cohesion and social capital formation,<br>- identity and local pride |
| 4. Building a knowledge-based economy and creativity | - use of the heritage for educational purposes,<br>- building of an individual cultural and human capital and creativity potential,<br>- heritage as inspiration for products and services created by creative industries |
| 5. Ecological effects | - avoiding the spreading of built-up areas,<br>- reuse of already developed areas,<br>- pressure on infrastructure consumption |
| 6. Integral element of the revitalization process | - the background for revitalization processes,<br>- the flagship process of revitalization (catalyst process),<br>- functional " animation " of the degraded space |

Source: Author's own elaboration based on: Murzyn-Kupisz, 2012: 82.

On the basis of the above comments, it can be said unequivocally that the sustainable use of cultural resources in a given area is a fundamental prerequisite for local development based on endogenous factors, and culture not only influences the process of development by the society, but in the modern world becomes an important element of competitive advantage.

The aspect of culture and its importance for development appears in many analyzes, especially when there are insufficient explanations of economic processes in econometric models and the questions are being asked, such as: why in similar conditions the society achieve different (unsatisfactory) effects. In such situations, discussion about mentioned factors that can explain causes of this phenomenon leads to the thinking of the analysis of cultural differences.

It is not only Throsby (2010: 22), Payne and Phillips (2011: 17-18) who points out the importance of the cultural factor of different development concepts, but most of all the authors of the classic work of Culture Matters: How Values Shape Human Progress by Lawrence E. Harrison, Samuel P. Huntington (2000), after extensive research simply concluding - culture matters.

## 3. Methodology of the study

The content of the study includes the analysis and assessment of the degree of sustainability of Poland through the prism of its voivodships, as well as economic, environmental, social (social implementation) and cultural dimensions[2]. The period included are years 2010 and 2015. The taxonomic method (linear ordering method) is used in the analysis of the research problem. This method allows isolation of areas similar to each other in terms of the examined features and lets them to be grouped into regions with similar development conditions (Nowak, 2003: 203, Krzyminiewska and Pondel, 2016: 194). The indicators for the institutional aspects of culture were adopted.

Taxonomic methods require the correct selection of diagnostic variables. Since no standard set of features has been developed in Poland to assess the degree of sustainability, it is necessary to use selected and, above all, available features (Kołodziejczyk et al., 2014: 26, Krzyminiewska and Pondel, 2016: 194). The data collected by the Central Statistical Office in the Local Data Bank

[2] According to the "square" of sustainable development proposed by Pascual (2009). Analysis of the level of sustainability of voivodships and Poland and the attempt to determine the importance of culture for this process is a continuation of the research conducted by the authors on measuring the level of sustainability of development. The analysis of sustainable development of rural communities in the Wielkopolska Region was presented in (Krzyminiewska and Pondel, 2016).

and published in the statistical yearbooks (forest information) were used for the task. The nature of variables was identified on the basis of substantive premise.

**Table 2. The set and character of the features taken into consideration for evaluation of the sustainable development of polish voivodships**

| Specification | Name of variable | Type of variable |
|---|---|---|
| **ECONOMIC DIMENSION** | | |
| X1 | Municipalities' own revenues per capita (in PLN) | STIMULANT |
| X2 | Employment rate per 1,000 population | STIMULANT |
| X3 | Officially registered unemployment rate (in% of working age population) | DESTIMULANT |
| X4 | Economic operators per 1,000 population at working age | STIMULANT |
| **SOCIAL DIMENSION (SOCIAL INCLUSION)** | | |
| X5 | Number of newly created jobs (In thousands) | STIMULANT |
| X6 | Places in day-care facilities for children and adolescents | STIMULANT |
| X7 | Places in the stationary social welfare | STIMULANT |
| X8 | Beds in care and treatment facilities | STIMULANT |
| **CULTURAL DIMENSION** | | |
| X9 | Members of clubs operating at cultural centers | STIMULANT |
| X10 | Graduates of courses organized by the cultural centers | STIMULANT |
| X11 | Public libraries readers per 1,000 inhabitants | STIMULANT |
| X12 | Number of philharmonic listeners | STIMULANT |
| X13 | Spectators in cinemas per 1,000 of population | STIMULANT |
| **ENVIRONMENTAL DIMENSION** | | |
| X14 | Population using wastewater treatment plants (% of total population) | STIMULANT |
| X15 | Water consumption for national economy and population (per capita in m3) | DESTIMULANT |
| X16 | Industrial and municipal waste water purified in % of wastewater requiring cleaning | STIMULANT |
| X17 | Forest cover (in %) | STIMULANT |

* For X9 and X10 variables, data are from 2011 and 2015 - due to their availability.
Source: Author's own elaboration.

Pearson's correlation coefficient and variation coefficient were used to assess the suitability of potential variables. The set of variables selected for the study and their nature is presented in Table 2.

The basics of descriptive statistics for diagnostic variables are enclosed in Table 3. The highest variation (both in 2010 and 2015) was noticed for water consumption for national economy and population (per capita), for number of newly created jobs and number of graduates of courses

organized by cultural centers. The smallest variation was observed in the percentage of purified industrial and municipal waste water.

**Table 3. Basic characteristics of the distribution of accepted diagnostic variables for assessment of Poland's sustainable development**

| Variable | Mean | | Standard deviation | | Variation coefficient | | Minimum | | Maximum | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2010 | 2015 | 2010 | 2015 | 2010 | 2015 | 2010 | 2015 | 2010 | 2015 |
| X1 | 126.2 | 162.8 | 61.0 | 60.8 | 0.48 | 0.37 | 72.4 | 113.9 | 323.6 | 335.1 |
| X2 | 211.6 | 219.4 | 29.6 | 32.2 | 0.14 | 0.15 | 169.0 | 175.0 | 272.0 | 283.0 |
| X3 | 10.2 | 7.9 | 1.4 | 1.6 | 0.13 | 0.21 | 7.6 | 6.0 | 12.5 | 11.9 |
| X4 | 1510.8 | 1658.0 | 269.2 | 313.1 | 0.18 | 0.19 | 1123.1 | 1227.6 | 2034.7 | 2333.5 |
| X5 | 38.1 | 37.2 | 29.7 | 30.0 | 0.78 | 0.80 | 13.6 | 10.0 | 123.2 | 123.9 |
| X6 | 6355.1 | 5467.4 | 4090.3 | 2922.6 | 0.64 | 0.53 | 1265.0 | 2083.0 | 12828.0 | 9958.0 |
| X7 | 6434.2 | 7125.9 | 3193.5 | 3664.6 | 0.50 | 0.51 | 2574.0 | 2916.0 | 14548.0 | 16136.0 |
| X8 | 1203.1 | 1554.5 | 909.9 | 1134.9 | 0.76 | 0.73 | 286.0 | 375.0 | 3216.0 | 4265.0 |
| X9 | 20679.9 | 31013.9 | 11224.9 | 17019.2 | 0.54 | 0.55 | 6700.0 | 12932.0 | 42217.0 | 65586.0 |
| X10 | 7077.5 | 7234.6 | 5450.0 | 6001.4 | 0.77 | 0.83 | 1155.0 | 1255.0 | 23265.0 | 23636.0 |
| X11 | 162.9 | 155.9 | 19.7 | 19.5 | 0.12 | 0.13 | 132.0 | 122.0 | 201.0 | 197.0 |
| X12 | 52143.8 | 69486.9 | 30587.2 | 43501.8 | 0.59 | 0.63 | 17514.0 | 17092.0 | 118074.0 | 155341.0 |
| X13 | 859.3 | 1074.8 | 312.7 | 317.3 | 0.36 | 0.30 | 424.0 | 711.0 | 1544.0 | 1679.0 |
| X14 | 65.3 | 72.4 | 9.2 | 7.4 | 0.14 | 0.10 | 48.9 | 57.2 | 79.3 | 83.7 |
| X15 | 269.4 | 261.5 | 317.1 | 304.8 | 1.17 | 1.17 | 65.9 | 73.5 | 1078.5 | 1063.0 |
| X16 | 93.8 | 96.4 | 9.4 | 5.6 | 0.10 | 0.10 | 67.8 | 80.8 | 99.9 | 100.0 |
| X17 | 29.9 | 30.2 | 7.1 | 7.1 | 0.24 | 0.24 | 21.1 | 21.3 | 49.0 | 49.2 |

Source: Author's own calculations.

One of the stages of the taxonomic method is the normalization of variables with different names and a varied range of values. In the analysis there was used the method of zero unitarization method, with the following formulas (Olejnik, 2006: 198-199, Krzyminiewska and Pondel, 2016: 196):

a) for stimulant variables:

$$z_{ij} = \frac{x_{ij} - \min x_{ij}}{\max x_{ij} - \min x_{ij}}$$

b) for destimulant variables:

$$z_{ij} = \frac{\max x_{ij} - x_{ij}}{\max x_{ij} - \min x_{ij}}$$

where:

$z_{ij}$ – normalized value of j variable of i voivodship,

$x_{ij}$ – value of j variable of i voivodship.

On the basis of the set of normalized diagnostic variables, the synthetic indicator of development was calculated, a taxonomic measure of sustainable development of municipalities (TMSD) for

particular orders and a general indicator for 2010 and 2015[3]. For this purpose, the non-model linear ordering method was applied:

$$TMRZ_t = \frac{1}{m}\sum_{j=1}^{m} Z_{ij}$$

where:

t – following number of a voivodship,

j – following number of diagnostic variable,

m – number of diagnostic variables.

Linear alignment results were the basis for the classification of voivodships due to homogeneous groups, in terms of the achieved level of sustainable development in separate dimensions and in general, in both analyzed years. The classification of the voivodships was based on the average value of the synthetic indicator ($TMSD_{av}$ for the whole population tested) and on the standard deviation (σ). For indicators that measure the level of sustainability in general and in economic, social (social inclusion), cultural and environmental dimensions, four ranges of indicators have been identified, including groups of voivodships with:

- with a very high level of development,
- with a high level of development,
- with a low level of development
- with a very low level of development[4].

The obtained results made it possible to determine which aspects of sustainable development weakens, which strengthens the level of the voivodship's balance, first of all what is the role of the culture and the variables reflecting it in balancing the development of voivodships and Poland.

## 4. Results of researches

According to the analysis, in the case of 10 out of 16 voivodships the value of the overall synthetic sustainability index in the period 2010-2015 decreased, for the three voivodships the value of the

[3] Synthetic development indicator assumes the values in the range [0,1] – the higher the value of the indicator, the better the situation of the object (Łogwiniuk, 2011: 15, Krzyminiewska and Pondel, 2016: 197).

[4] Voivodships with a very high level of development: ($TMSD_{av}$ + σ) and more; Voivodships of high development level: ($TMSD_{en}$) to ($TMSD_{en}$ + σ); Voivodships with low developmental level: ($TMSD_{en}$) to ($TMSD_{en}$ - σ); Voivodships with a very low level of development: ($TMSD_{en}$ - σ) and less.

indicator remained at the same level, whereas in only three voivodships this indicator increased (Table 4).

**Table 4. Values of the synthetic sustainable development index for Polish voivodships in 2010 and 2015**

| Vovoidship | $TMSD_{econ.}$ | $TMSD_{social}$ | $TMSD_{cult.}$ | $TMSD_{env.}$ | $TMSD_{gen.}$ |
|---|---|---|---|---|---|
| Dolnośląskie | | | | | |
| 2010 | 0.6414 | 0.4722 | 0.5026 | 0.5085 | 0.5312 |
| 2015 | 0.5727 | 0.4337 | 0.5504 | 0.5126 | 0.5173 |
| Kujawsko-Pomorskie | | | | | |
| 2010 | 0.3454 | 0.2742 | 0.3131 | 0.4316 | 0.3411 |
| 2015 | 0.2666 | 0.2835 | 0.2557 | 0.3951 | 0.3002 |
| Lubelskie | | | | | |
| 2010 | 0.1462 | 0.1624 | 0.2554 | 0.3192 | 0.2208 |
| 2015 | 0.1725 | 0.1514 | 0.2272 | 0.2775 | 0.2071 |
| Lubuskie | | | | | |
| 2010 | 0.4419 | 0.0818 | 0.2359 | 0.6482 | 0.3519 |
| 2015 | 0.2681 | 0.0446 | 0.1793 | 0.6508 | 0.2857 |
| Łódzkie | | | | | |
| 2010 | 0.3677 | 0.3060 | 0.3110 | 0.3993 | 0.3460 |
| 2015 | 0.3348 | 0.3080 | 0.3499 | 0.3244 | 0.3293 |
| Małopolskie | | | | | |
| 2010 | 0.3379 | 0.5319 | 0.7469 | 0.3753 | 0.4980 |
| 2015 | 0.3143 | 0.5825 | 0.7197 | 0.3380 | 0.4887 |
| Mazowieckie | | | | | |
| 2010 | 0.7500 | 1.0000 | 0.8110 | 0.2669 | 0.7070 |
| 2015 | 0.7754 | 0.9645 | 0.7336 | 0.4777 | 0.7378 |
| Opolskie | | | | | |
| 2010 | 0.3251 | 0.1265 | 0.1422 | 0.3184 | 0.2281 |
| 2015 | 0.2122 | 0.0764 | 0.1703 | 0.4529 | 0.2280 |
| Podkarpackie | | | | | |
| 2010 | 0.3093 | 0.1726 | 0.2696 | 0.5210 | 0.3181 |
| 2015 | 0.3216 | 0.2067 | 0.2549 | 0.5360 | 0.3298 |
| Podlaskie | | | | | |
| 2010 | 0.1894 | 0.0518 | 0.1538 | 0.4461 | 0.2103 |
| 2015 | 0.0871 | 0.0286 | 0.0480 | 0.4314 | 0.1488 |
| Pomorskie | | | | | |
| 2010 | 0.4601 | 0.4051 | 0.4262 | 0.6379 | 0.4824 |
| 2015 | 0.3922 | 0.3495 | 0.6011 | 0.6288 | 0.4929 |
| Śląskie | | | | | |
| 2010 | 0.4608 | 0.7086 | 0.6711 | 0.4356 | 0.5690 |
| 2015 | 0.4222 | 0.7561 | 0.6766 | 0.3612 | 0.5540 |
| Świętokrzyskie | | | | | |
| 2010 | 0.3633 | 0.0647 | 0.0542 | 0.3109 | 0.1983 |
| 2015 | 0.2498 | 0.0857 | 0.0702 | 0.3552 | 0.1902 |
| Warmińsko-Mazurskie | | | | | |
| 2010 | 0.1997 | 0.0537 | 0.2680 | 0.5170 | 0.2596 |
| 2015 | 0.2294 | 0.0640 | 0.1647 | 0.5120 | 0.2425 |
| Wielkopolskie | | | | | |
| 2010 | 0.4810 | 0.5298 | 0.4753 | 0.4944 | 0.4951 |
| 2015 | 0.4399 | 0.5282 | 0.4754 | 0.5172 | 0.4902 |
| Zachodniopomorskie | | | | | |
| 2010 | 0.5523 | 0.2547 | 0.2580 | 0.8287 | 0.4734 |
| 2015 | 0.3304 | 0.2990 | 0.3404 | 0.8193 | 0.4473 |

Source: Author's own calculations.

It is not possible to assess this phenomenon favorably, especially if the decreasing average number of newly created jobs in voivodships, decreasing number of places in day-care centers for children and young people, decreasing number of readers of public libraries has been decisive. The deterioration of this measure was influenced primarily by the economic component, which value in the analyzed period has got worse in twelve of Poland's sixteen provinces. In the case of the other dimensions of sustainable development, half of the voivodships recorded an increase in the value of partial indicators, in half of them - a decrease.

An interesting topic is the importance of the cultural dimension for shaping the sustainable development index. As shown in Table 4, in 2010 in one of the voivodships (Małopolskie), the impact of this component on the overall indicator was the greatest in 2015 - in two voivodships (Łódzkie and Małopolskie). In 2010, the cultural dimension was the second most important indicator for shaping the overall indicator in four voivodships (Lubelskie, Mazowieckie, Śląskie and Warmińsko-Mazurskie), in 2015 already in five (Dolnośląskie, Lubelskie, Pomorskie, Śląskie and Zachodniopomorskie). It confirms the thesis that taking cultural dimension into account for the assessment of the level of sustainability makes sense and cultural activities undoubtedly influence this level.

When assessing the level of sustainability of Polish voivodships in 2010 and 2015, the prevailing number of voivodships was characterized by a low level of the phenomenon - the low and very low synthetic indicator of sustainable development concerned about 55-65% of voivodships (Table 5). In every aspect of sustainable development, the highest percentage of voivodships reached a low level of development - in the case of the social and cultural dimension, half of such voivodships were the same in 2010 and 2015, in the case of environmental governance, the percentage was 37.5%, while the share of voivodships with the low level of economic development was at level of 37.5% and 56.3%.

As it has been shown in Table 5, out of the four dimensions of sustainable development, the highest proportion of voivodships achieved a very high TMSD in the case of cultural dimension in 2015 – it has reached 25% (for the economic and social aspect - 12.5%, for the environmental aspect – 18.8%). In addition, only in the case of cultural dimension, this percentage increased compared to 2010.

**Table 5. Number of voivodships in Poland according to the level of sustainability**

| Synthetic sustainable development indicator | 2010 | | 2015 | |
|---|---|---|---|---|
| | TMSD value | No. of vovoidships | TMSD value | No. of vovoidships |
| $TMSD_{general}$ | | | | |
| - very high | above 0.5405 | 2 | above 0.5376 | 2 |
| - high | 0.3894-0.5405 | 5 | 0.3744-0.5376 | 5 |
| - low | 0.2383-0.3893 | 5 | 0.2112-0.3743 | 6 |
| - very low | below 0.2383 | 4 | below 0.2112 | 3 |
| $TMSD_{economical}$ | | | | |
| - very high | above 0.5597 | 2 | above 0.5008 | 2 |
| - high | 0.3982-0.5597 | 5 | 0.3368-0.5008 | 3 |
| - low | 0.2367-0.3981 | 6 | 0.1728-0.3368 | 9 |
| - very low | below 0.2367 | 3 | below 0.1728 | 2 |
| $TMSD_{social}$ | | | | |
| - very high | above 0.5940 | 2 | above 0.5954 | 2 |
| - high | 0.3247-0.5940 | 4 | 0.3227-0.5954 | 4 |
| - low | 0.0554-0.3246 | 8 | 0.0500-0.3226 | 8 |
| - very low | below 0.0554 | 2 | below 0.0500 | 2 |
| $TMSD_{cultural}$ | | | | |
| - very high | above 0.5887 | 3 | above 0.5952 | 4 |
| - high | 0.3684-0.5887 | 3 | 0.3636-0.5952 | 2 |
| - low | 0.1481-0.3683 | 8 | 0.1320-0.3635 | 8 |
| - very low | below 0.1481 | 2 | below 0.1320 | 2 |
| $TMSD_{environmental}$ | | | | |
| - very high | above 0.6133 | 3 | above 0.6153 | 3 |
| - high | 0.4662-0.6133 | 4 | 0.4744-0.6153 | 5 |
| - low | 0.3191-0.4661 | 6 | 0.3335-0.4743 | 6 |
| - very low | below 0.3191 | 3 | below 0.3335 | 2 |

Source: Author's own calculations.

The conducted analysis of the source data and the set of synthetic sustainability indicators presented in Table 5 - general and for its individual dimensions confirms the above mentioned thesis that the economic aspect was and is weakening the level of sustainability of Polish voivodships, predestines about this a fact, that in 2010 - nine and, in 2015 eleven of the surveyed entities were characterized by low and very low growth in the economic dimension, and also the fact that only for this dimension of sustainable development, in 2015 the percentage of voivodships with a very low level increased.

As it results from tables 5 and 6, changes in the level of sustainability in individual voivodships in the period 2010-2015 were not significant - most of the voivodships were in the same category of sustainability in both years, except for the Opolskie voivodship - that in 2015 was found among voivodships with a low, and in 2010 with a very low level of the examined phenomenon.

**Table 6. Typology of voivodships in Poland on the basis of the level of sustainability**

| $TMRZ_{general}$ | Voivodships | |
|---|---|---|
| | **2010** | **2015** |
| **very high** | Mazowieckie, Śląskie | Mazowieckie, Śląskie |
| **high** | Dolnośląskie, Małopolskie, Pomorskie, Wielkopolskie, Zachodniopomorskie | Dolnośląskie, Małopolskie, Pomorskie, Wielkopolskie, Zachodniopomorskie |
| **low** | Kujawsko-Pomorskie, Lubuskie, Łódzkie, Podkarpackie, Warmińsko-Mazurskie | Kujawsko-Pomorskie, Lubuskie, Łódzkie, Opolskie, Podkarpackie, Warmińsko-Mazurskie |
| **very low** | Lubelskie, Opolskie, Podlaskie, Świętokrzyskie | Lubelskie, Podlaskie, Świętokrzyskie |

Source: Author's own elaboration based on Tables 4 and 5.

By evaluating the importance of the cultural dimension for the level of sustainability of the voivodships, the units under study were also organized, to include the synthetic indicator based on three dimensions: economic, social and environmental and a four-dimensional indicator additionally - cultural. The results of this order are presented in Table 7.

**Table 7. Level of sustainability of voivodships in Poland - linear ordering results**

| **Voivodships** | **TMSD (ec.+so.+cul. +en.)** | **TMSD (ec.+so.+cul. +en.)** | **Average position** | **TMSD (ec.+so.+en.)** | **TMSD (ec.+so.+en.)** | **Average position** |
|---|---|---|---|---|---|---|
| | **2010** | **2015** | | **2010** | **2015** | |
| Mazowieckie | 1 | 1 | **1** | 1 | 1 | **1** |
| Śląskie | 2 | 2 | **2** | 4 | 2 | **3** |
| Dolnośląskie | 3 | 3 | **3** | 3 | 3 | **3** |
| Małopolskie | 4 | 6 | **5** | 7 | 7 | **7** |
| Pomorskie | 6 | 4 | **5** | 6 | 6 | **6** |
| Wielkopolskie | 5 | 5 | **5** | 5 | 4 | **4.5** |
| Zachodniopomorskie | 7 | 7 | **7** | 2 | 5 | **3.5** |
| Łódzkie | 9 | 9 | **9** | 9 | 9 | **9** |
| Lubuskie | 8 | 11 | **9.5** | 8 | 10 | **9** |
| Podkarpackie | 11 | 8 | **9.5** | 11 | 8 | **9.5** |
| Kujawsko-Pomorskie | 10 | 10 | **10** | 10 | 11 | **10.5** |
| Warmińsko-Mazurskie | 12 | 12 | **12** | 12 | 12 | **12** |
| Opolskie | 13 | 13 | **13** | 13 | 13 | **13** |
| Lubelskie | 14 | 14 | **14** | 16 | 15 | **15.5** |
| Podlaskie | 15 | 16 | **15.5** | 15 | 16 | **15.5** |
| Świętokrzyskie | 16 | 15 | **15.5** | 14 | 14 | **14** |

* The linear ordering method allowed to rank the voivodships from the best (1) to the worst (16) on the basis of the general TMSD level, defined in two variants: as the sum of the economic, social, cultural and environmental TMSD indicators and as the sum of economic, social and environmental TMSD.

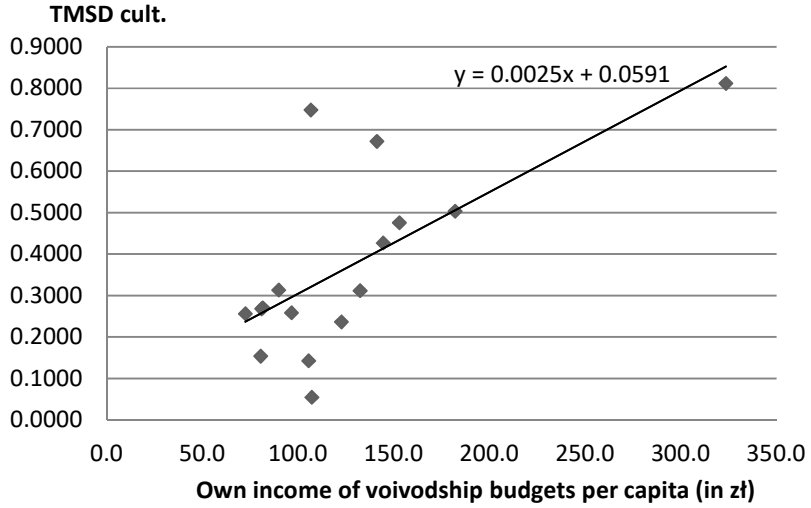
Source: Author's own elaboration based on Table 3.

The confirmation of the thesis about the importance of culture for sustainable development again was obtained during the analysis. As mentioned above, in Małopolskie voivodship the impact of this component on the overall indicator was greatest in 2010 and 2015. Taking into account the value of the synthetic indicator of sustainable development based on three dimensions, the voivodship got into the seventh position in the linear ordering procedure while assuming the value of this indicator taking into account the cultural dimension - fifth position.

A similar regularity can be observed on the example of the Lubelskie voivodship, where the impact of the partial cultural index on the overall sustainability index was spotted, and the position change in the ranking of voivodships according to the general TMSD including cultural dimension (higher position).

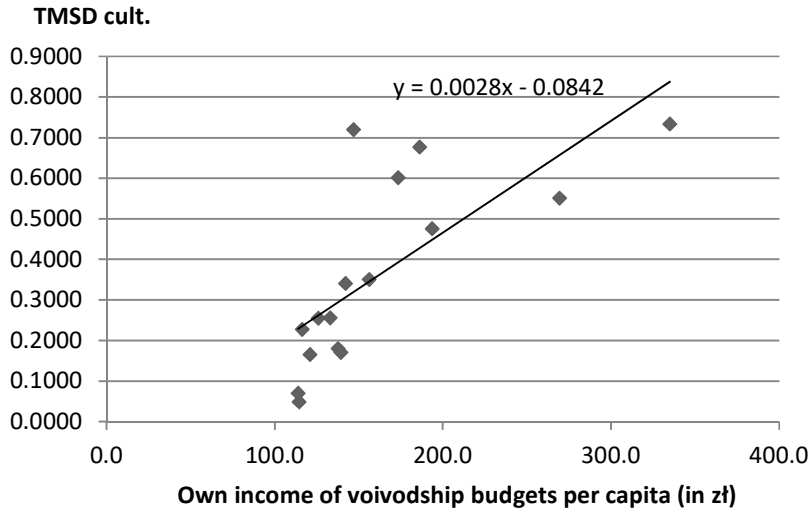
The implementation of sustainable development assumptions and the implementation of its principles depend very much on the financial situation of the self-government unit. It is interesting from the point of view of the purpose of the study to determine how the financial situation of the surveyed entities is related to the implementation of actions for sustainable development in the cultural dimension. The coefficient of correlation between own revenues of voivodship budgets per capita against the formation of $TMSD_{cult}$ was used for this purpose and the distribution of the above features together with the regression function are shown in Figures 3 and 4.

**Figure 3. Dependence of cultural sustainability index on own revenues of voivodship budgets per capita (scatter plot, year 2010)**




Source: Author's own elaboration.

**Figure 4. Dependence of cultural sustainability index on own revenues of voivodship budgets per capita (scatter plot, year 2015)**




Source: Author's own elaboration.

The correlation between own revenues of voivodship budgets per capita and $TMSD_{cult}$ is linear - the higher the value of income, the higher the value of the TMSD. The coefficients of correlation between the indicated variables were: for 2010 - 0.6786, for 2015 - 0.7221, which confirms a fairly strong linear correlation.

From the point of view of the local self-government units, the starting point of all activities that are part of the concept of sustainable development are the possibilities of their financing. In the ranking of the seven provinces according to the highest $TMSD_{gen}$ in both 2010 and 2015 there were six municipalities that joined seven communities with the highest economic sustainability index (Tables 3 and 6). On the basis of the research, there can be defined the following regularity - the voivodships placed in the highest positions in the ranking of units according to $TMSD_{gen}$ also occupy the highest positions in the ranking of voivodships according to partitive TMSD, including $TMSD_{cult}$.

## 4. Conclusion

The article presents an analysis of the level of sustainability of the country development through evaluation of selected indicators characterizing Polish voivodships. The indicators used and the research method adopted are the subjective choice of the Authors, what can undoubtedly stimulate

discussion. However, the choice of the diagnostic features was mostly determined by their accessibility. In case of the cultural indicators, the characteristics associated with institutional approach were adopted. Probably expanding the substantive scope of the variables would allow for more comprehensive analysis. However, the approach proposed by the Authors has made it possible to demonstrate the appropriateness of distinguishing the cultural dimension in evaluating and measuring the level of sustainability of voivodship.

On the basis of the research on Polish voivodships, it can be stated that in the years 2010 and 2015 the predominant number of units was characterized by a low level of sustainability - the low and very low synthetic indicator that is reflecting the level of this phenomenon concerned about 55-65% of voivodships in both periods, additionally in the aspect of sustainable development, the highest percentage of voivodships reached a low level of development.

The cultural dimension plays a very important role in shaping the general synthetic indicator of sustainable development - in 2010, in one of the voivodships (Małopolskie), the impact of this component on the general indicator was the greatest in two voivodships (Łódź and Małopolskie) in 2015. The inclusion of cultural indicators in the analysis of the level of sustainability of voivodships also influenced the changes in the locations of some voivodships in their ranking according to the growing $TMSD_{gen}$.

The analysis of the level of sustainability of Polish voivodships confirms the increasingly popular opinion on the recognition of the culture as the "fourth pillar" of sustainable development. The perception of culture as an area in opposition to development is increasingly rejected - inhibiting or even preventing it. Nowadays in the widely understood "culture" one can see development opportunities, its development potential is recognized. The concept of culture as an institution adopted in this elaboration, cultural goods and services can be translated in multifaceted way into the development of the country, for example, by increasing the income of the entities, the places of work, the image of the territorial units or the quality of life.

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GRAŻYNA KRZYMINIEWSKA AND HANNA PONDEL

## *Miejsce kultury w zrównoważonym rozwoju polskich województw*

### *Streszczenie*

Celem opracowania jest próba oceny znaczenia kultury dla zrównoważonego rozwoju polskich województw. Dla realizacji celu badawczego zastosowano metodę taksonomiczną, która pozwala na wyodrębnienie obszarów podobnych do siebie pod względem badanych cech oraz umożliwia ich pogrupowanie w rejony o podobnych warunkach rozwoju. Na podstawie przeprowadzonej analizy danych źródłowych i wyznaczonych syntetycznych wskaźników zrównoważonego rozwoju można stwierdzić z całą pewnością, że działania z zakresu kultury (w ujęciu instytucjonalnym) podejmowane w polskich województwach mają istotne znaczenie dla poziomu ich zrównoważenia.

***Słowa kluczowe**:* kultura, zrównoważony rozwój, województwa, metoda taksonomiczna

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