

Evaluation of the Local Spatial Policy in Poland with Regard to Sustainable Development

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Received: 19 April 2012

Accepted: 9 August 2012

Abstract

The study analyzes the spatial policy formulated on the local level with regard to the sustainable development of communities located in Poland, in the Wrocław District. Our research starts with an analysis of the current state of the communities with respect to sustainable development. The further part of the study involved research regarding the natural environment, as formulated in the study of determinants and directions for the spatial management documents of each communities. The identification of each functional area planned with regard to spatial policy was the basis for evaluating the efficiency of local authorities in the context of sustainable development. The evaluation was undertaken using sustainable development indicators for environmental order, as well as the approved indicators for the sustainable development of a spatial policy on the local level.

Keywords: sustainable development, spatial policy of the communities

Introduction

The role of the planning system and spatial development in Poland in the shaping of spatial structure is decisive, while planning and location instruments still remain the basic tools when it comes to shaping space filled with anthropogenic objects [1, 2]. The spatial development of Poland on the local level is mainly based on the spatial policy defined in the Study of Determinants and Directions for the Spatial Management of a Community document. From among the many definitions of “policy” one can also differentiate one, according to which policy is the art of ruling, the art of attaining set goals using properly selected instruments (means) [3]. An overview of the many uses of the term “policy” shows that there is no exclusive and single-layer definition of such. Local politics is realized through partial policies introduced by local authorities. Partial policies include: social policy, economic policy, budget policy, environmental policy, spatial policy, and

information policy. Through the realization of the indicated policies, the authorities aim to achieve complex socio-economic development of the territorial unit in question [4].

This also leads to the assumption that a local policy is realized in a specific space, while socio-economic development is realized through spatial policy. The tool used in Poland for the realization of spatial policy included in the Study of Determinants and Directions for the Spatial Management of a Community is the local spatial development plan. One might venture to say after Davidson F. [5], Kozłowski S. [6] and Peński W. [7] that planning is one of the most important tools utilized in the management process, and that it is also used as a tool that forms the future image of the country and region and, under Polish conditions, is decisive for the quality of human life and the functioning of the natural environment. The basic principle used in planning and spatial management in Poland is, along with spatial order, sustainable development.

In their activities regarding spatial planning, urban planners seek the main tool for creating the spatial sphere in

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order to significantly influence the remaining spheres of sustainable development [8].

Sustainable development policies typically encompass three main themes: economic, environmental, and social, but according to the European Landscape Convention (Council of Europe, 2000) and UNESCO's Universal Declaration on Cultural Diversity (UNESCO, 2002), there is a fourth cultural element to sustainability. Prieur, discussing the preamble to the European Landscape Convention, refers to its promotion of: "all four ingredients of sustainable development (social, ecological economic and cultural improvement)" [2, 9].

The goal of the study is to evaluate the spatial policy realized on the local level with regard to the sustainable development of communities, including an evaluation of the scale of spatial changes currently under development. The evaluation is conducted using approved indicators.

Other publications by the authors of the study dealt with the evaluation of the spatial policy of touristically attractive communities, with regard to sustainable development, using (to a small degree) sustainable development indicators [2, 8]. The evaluation was rather descriptive in manner. One of the latest publications by the authors utilized original sustainable development indicators to evaluate spatial policy with regard to sustainable development [10]. The evaluation involved communities partially located in landscape parks, i.e. under protection with high environmental values.

Methodology

Numerous studies have been undertaken in Europe in an attempt to formulate a system of indicators for the monitoring of sustainable development on a local level. According to Kozłowski [6, 10], the following sets of indicators have the highest comparative value for the construction of a substantive structure of a local module of sustainable development indicators in Poland: Common European Sustainable Development Indicators (10 indicators), urban audit indicators (21 groups of indicators), Environmental Pressure indicators (TEPI), pressure indicators (the ecological footprint), the HABITAT agenda indicators, sets of indicators utilized in specific local units (the Ghent Barometer for Sustainable Development), and local indicators for the evaluation of sustainable development in local British territorial units (in London: LITMUS, Strathclyde).

In Poland, the retrieval of data that could be used to monitor sustainable development on the local level is extremely difficult. The information gathered in Local Data Bank, part of the Central Statistical Office, could serve as a basis for the retrieval of information on sustainable development, however, the data stored there is incomplete. Worldwide, one of the first institutions to introduce a set of environmental indicators was the Organization for Economic Co-operation and Development (OECD, 1991, 1993). Intensive work with indicators also was performed by the World Health Organization (WHO) in 1993 and 1994 [10, 11].

Creating a system of sustainable development indicators is not an easy task. The key issue has to do with maintaining balance between the need to represent a wide spectrum of phenomena related to durability and the need for the indicators to remain simple and easy to adapt. Sustainable development has to involve all the important functions related to human functioning: the economy, society, culture, the natural environment, the management of space, and administration. Thus, a system of indicators dealing with these elements has to be complex, which makes it more difficult in practical use [12].

What is more, the choice for variables and measurement criteria depends on the definition of durability, which is hard to generalize. Durability is used for normative aspects, values, quality of life and questions regarding the meaning of life. Thus, one has to attempt to leave conventional indicators behind, accepting semi-quantitative or even qualitative indicators. If one decides to reject qualitative criteria that cannot be objectively analyzed, one shall probably omit certain key sustainable development characteristics [13-15].

The authors of the study focused on the evaluation of spatial development in the context of the spatial policy realized in communities from the Wrocław district. For comparison, communities containing landscape parks have been juxtaposed against communities outside the park area in separate tables. Some of the measurements (indicators) used in the study have been retrieved by means of direct research. The data for spatial policy has been formulated on the basis of measurements performed in the selected areas for the realization of various functions in the document delineating the spatial policy of each communities.

From among all approved spatial policy evaluation indicators, the dominant group contains the so-called environmental and ecodevelopment indicators. Spatial policy influences the final form of space, especially the forms of its management. It is inherently related to environmental protection and ecodevelopment, fosters the protection of the cultural environment and economic growth and, to a lesser degree, influences the social sphere, which is difficult to measure. One has to keep in mind that the study focuses on the evaluation of spatial policy, i.e. the approved community development guidelines from the Study document.

For the purpose of this research, the Sustainable Seattle project [16] has been used to evaluate the current state of the environment, as it is a classic example of a local system of sustainable city indicators. Special attention was paid to the direct aspects of social life, economy and the environment, as well as to the identification of the indicators in the process of participation. The well-established indicator selection process, used and incorporated in many further such initiatives around the world, is considered to be the strongest point of the project [17]. For the purpose of research, the indicators have been modified in a way that allows for them to be used in the specific context of local Wrocław district communities. The approved indicators are described in Tables 1 and 2. Some indicators have been excluded from analysis due to a lack of data on the local level.

Table 1. Local indicators selected for the evaluation of sustainable development in communities.

No.	Indicator name	Unit	Data source
The environment, population, and resources			
1.	Land use: Share of agricultural land area in the total area of the community (indirectly also loss of agricultural land compared to the previous year)	%	CSO-LDB
2.	Land use: Share of areas of legally protected particular environmental value in the total community area	%	CSO-LDB
3.	Land use: Share of forest areas in the total community area	%	CSO-LDB
4.	Land use: Share of areas for communication in the total community area	%	CSO-LDB
5.	Land use: Share of residential areas in the total community area	%	CSO-LDB
6.	Land use: Share of housing areas per 1 resident	Ha/resident	CSO-LDB
7.	Population density of the village's developed area per 1 km ²	no. of residents per 1 km ²	CSO-LDB
8.	Population density of the village area in general per 1 km ²	no. of residents per 1 km ²	CSO-LDB
9.	Share of buildings connected to the water-supply system in the general number of buildings	%	CSO-LDB
10.	Share of buildings connected to the sewage system in the general number of buildings	%	CSO-LDB
11.	Relationship between the length of the sewage system and water-supply system in the area of the village	1:1 (1)	CSO-LDB
12.	Share of residents using sewage plants	%	CSO-LDB
13.	Unpurified waste channeled to water reservoirs and the ground	m ³	CSO-LDB
14.	Emissions of gas pollution by particularly pollutive plants	t/r	CSO-LDB
15.	Emissions of dust pollution by particularly pollutive plants	t/r	CSO-LDB
Economy			
16.	Share of the registered unemployed in the total working age population including men, women, both.	%	CSO-LDB
17.	Share of people employed in the agricultural sector in the total amount of the employed	%	CSO-LDB
18.	New registered business entities in a given year — individuals	amount	CSO-LDB
19.	Residential resources, living space	m ² /1 resident	CSO-LDB
20.	Health care expenditures	%	CSO-LDB
Culture and society			
21.	Area of cultivated green zones and estate green zones per 1 resident	ha/resident	
22.	Green space expenditures for 1 resident	zł	CSO-LDB
23.	Community centre and club activity	amount	CSO-LDB
24.	Club and community centre members	number of members	CSO-LDB
25.	Commune expenditures for preventing alcoholism	zł	CSO-LDB

Source: Own elaboration using Indicators for Sustainable Community 1998, Sustainable Seattle, Seattle 1998.

The environmental area evaluation has been performed throughout a period of 10 years, in 5 year-long intervals, with three measurement stages: 2005 and 2010. Previous data is unavailable. Data for the indicated features has been gathered in comparative tables. The table has been excluded from the study due to the limitations regarding the length of the article.

Research was conducted in communities in the Wrocław district, including the Joranów Śląski, Mietków,

Kąty Wrocławskie, and Sobótka, located partially within the borders of natural landscape parks, as well as in Czernica, Długołęka, Kobierzyce, Siechnice, and Żórawina. Ślęza Landscape Park is located within Sobótka and Jordanów Śląski, while the Bystrzyca Valley Landscape Park is located in Sobótka, Mietków, and Kąty Wrocławskie. The Ślęza Landscape Park contains Ślęza Massif, Kiełczyńskie Hills, and Jańska Mountain. The Bystrzyca Valley Landscape Park encompasses areas locat-

Table 2. Indicators of sustainable development approved for the evaluation of the spatial policy realized in the studied communities.

No.	Indicator name/definition	Unit	Data source
1.	Degree of community areas covered by spatial development plans	%	RDB
2.	Area of terrain planned for housing construction in the spatial policy per 1 resident	m ²	Own calculations
3.	Area of terrain planned for economic activity in the spatial policy per 1 resident	m ²	Own calculations
4.	Share of areas planned for change in purpose for residential-service purpose accepted in the spatial policy of the village, in total area	%	Own calculations
5.	Share of areas planned for change in purpose for general construction (excluding tourism), accepted in the spatial policy of the village, in total area	%	Own calculations
6.	Planned area for construction vs. currently built-up area	01:01	Own calculations
7.	Area of terrain planned for afforestation in the spatial policy	Ha	Own calculations
8.	Share of areas planned for afforestation in the spatial policy in the total area of the communities	%	Own calculations
9.	Smallest distance of built-up area from the forest	m	Own observations
10.	Smallest distance of built-up area from the river with its biological cover	m	Own observations

Source: Own elaboration using [10].

ed in Nizina Śląska. The Bystrzyca River constitutes the park's main axis and is one of the most important confluences of the Odra River.

Environmental Changes Studied on the Basis of Approved Indicators

The communities analyzed in our study are located in the vicinity of the administrative border of Wrocław (circa 700,000 citizens), which is why a number of changes occur there under the influence of the large city. Suburbanization processes [18, 19], defined as the migrations of people from city centers to their peripheries, undoubtedly influence the various changes within the studied communities. Research on the current manner of land use showed that agricultural areas in each communities are a significant part of the overall area of the communities, regardless of whether they are environmentally protected or not. Agricultural land constitutes a major part of each communities, from 68.42% in Sobótka up to 86.54% in Jordanów Śląski, which are both protected areas, and from 57.74% up to 91.78% in communities located outside of landscape parks. It is thus possible to assert that the current manner of land use in the Wrocław district is beneficial for maintaining environmental order. Registering the dynamics of changes in the share of estate areas did not reveal rapid space seizure for urban purposes, with the changes maintained between 0.1% and 0.2% in each communities.

Water and sewage management, as well as the amount of waste channeled into water and soil, constitute a separate issue analyzed in the study (Figs. 1, 2). Currently, about 90% of residents in each communities are connected to the water-supply system, even 96% in Jordanów. This number has been increasing throughout the period of the years studied.

Unfortunately, there is still a large disproportion between the number of residents using the water-supply

system and the number of residents using the sewage system. The share of citizens using the sewage system has been estimated below (Fig. 1).

There is no sewage in Jordanów Śląski, whereas in the remaining communities (apart from Kąty Wrocławskie), the share of residents expelling waste into the sewage system connected to a sewage plant is on the increase. In 2010 it was highest in Czernica.

Research showed that sewers that require purification, connected to surface waters or the soil, are not monitored in Jordanów Śląski, which does not mean that they do not exist there. In the remaining communes, their amount increased from 2000 to 2010.

Fig. 2. The share of sewers channeling unpurified waste into surface waters or soil, per 1 resident in the years 2005, 2010.

The greatest increase has been noted in Kąty Wrocławskie, and then in Długołęka, Sobótka, and Czernica.

The values registered in 2010 in the remaining communities were more than three times higher than in the year

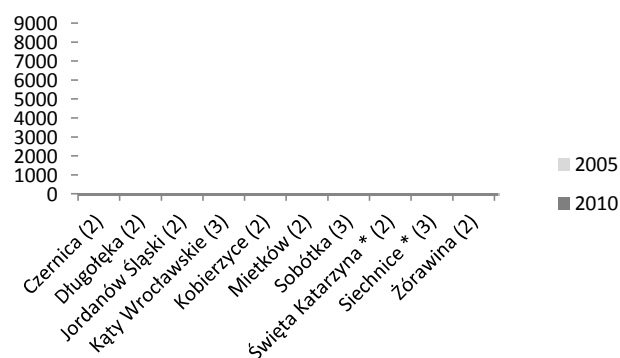


Fig. 1. The number of inhabitants connected to the sewage plants in selected communities in 2005 and 2010.

Table 3. The value of approved indicators of sustainable development for the spatial policy realized in the studied communities in the Landscape Park.

No.	Indicator name/definition	Unit	Commune			
			Sobótka	Jordanów	Mietków	Kąty Wrocławskie
1.	Areas under environmental protection	ha	4448.10	540.00	3188.00	4021.00
2.	Degree of communities areas covered by spatial development plans	%	76.90	17.90	99.85	100
3.	Area of terrain planned for housing construction in the spatial policy per 1 resident	m ²	1284.65	1436.96	570.40	1597.70
4.	Area of terrain planned for economic activity in the spatial policy per 1 resident	m ²	506.90	947.09	197.04	1033.00
5.	Share of areas planned for change in purpose into residential-service purpose accepted in the spatial policy of the village, in total area	%	11.98	7.77	2.64	18.55
6.	Share of areas planned for change in purpose for general construction (excluding tourism), accepted in the spatial policy of the village, in total area	%	16.71	12.89	3.60	30.55
7.	Planned area for construction vs. currently built-up area	01:01	4.83:1	3.02:1	2.34:1	9.43:1
8.	Area of terrain planned for afforestation in the spatial policy	ha	0.00	82.00	86.50	0.00
9.	Share of areas planned for afforestation in the spatial policy in the total area of the communities	%	0.00	1.45	1.03	0.00
10.	Smallest distance of built-up area from the forest	m	0	5.00	0	5.00
11.	Smallest distance of built-up area from the river with its biological cover	m	10.00	10.00	10.00	10.00

Source: own elaboration [10].

2000. The largest increases were noted in Kąty Wrocławskie, Długoleka, Sobótka, and Czernica, i.e. in two communities under environmental protection and two communities with no environmental protection.

Air pollution decreased in the communities in question. The emission levels for gas and dust pollution by particularly pollutive plants, registered in Kobierzyce, Sobótka, and Siechnica, decreased between 2005-10 to zero.

An analysis of the share of the registered unemployed in working age population showed surprisingly positive results. In each of the analyzed communes this amount decreased, sometimes even by half. The largest percentage of the unemployed was noted in 2005 in Sobótka (13.3%), Mietków (11.2%), Kąty Wrocławskie (11.0%), and Żórawina (10.2%). It was also high in other communes, ranging from circa 9.0-7.0%. In 2010 this amount decreased and

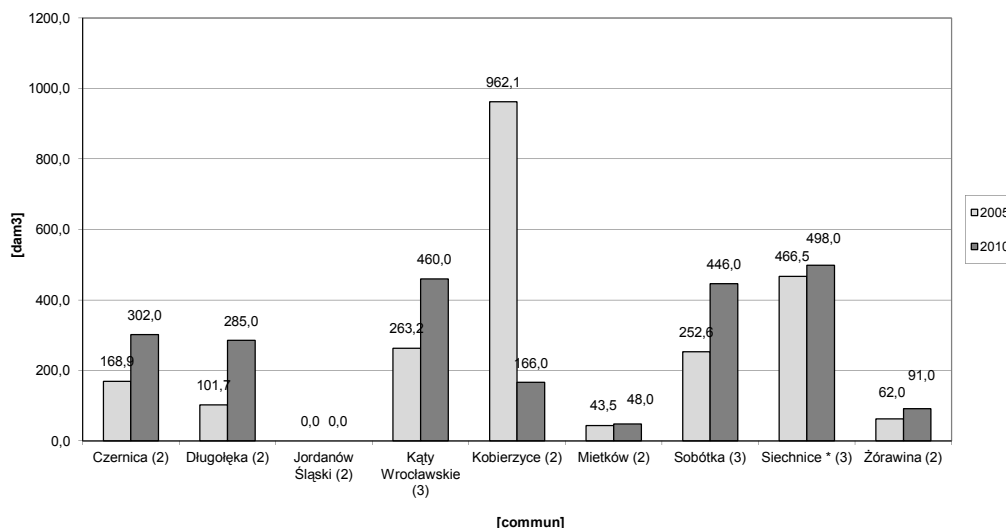


Fig. 2. The share of sewers channeling unpurified waste into surface waters or soil, per 1 resident in the years 2005, 2010.

Table 4. The value of approved indicators of sustainable development for the spatial policy realised in the studied communities outside of the park area.

No.	Indicator name/definition	Unit	Communities			
			Czernica	Kobierzyce	Siechnice	Żórawina
1.	Areas under environmental protection	ha	0	0	0	0
2.	Degree of communities areas covered by spatial development plans	%	39.30	100	88.85	0.20
3.	Area of terrain planned for housing construction in the spatial policy per 1 resident	m ²	1770.70	1396.30	2766.38	3241.70
4.	Area of terrain planned for economic activity in the spatial policy per 1 resident	m ²	473.25	1087.38	1160.02	510.85
5.	Share of areas planned for change in purpose into residential-service purpose accepted in the spatial policy of the village, in total area	%	23.70	14.76	44.14	21.13
6.	Share of areas planned for change in purpose for general construction (excluding tourism), accepted in the spatial policy of the village, in total area	%	30.05	26.25	62.64	24.46%
7.	Planned area for construction vs. currently built-up area	01:01	4.34:1	2.98:1	5.52:1	5.92:1
8.	Area of terrain planned for afforestation in the spatial policy	ha	0	0	98.32	0
9.	Share of areas planned for afforestation in the spatial policy in the total area of the communities	%	0	0	0.96	0
10.	Smallest distance of built-up area from the forest	m	1	10	10	1
11.	Smallest distance of built-up area from the river with its biological cover	m	10	10	10	3

Source: own elaboration

equaled 4.2% in Sobótka, 4.2% in Mietków, 3.3% in Kały Wrocławskie, and 4.2% in Żórawina. It varied between 3.6-3.8% in the remaining communes. The evaluation of unemployment divided between women and men shows an average 1% higher result among women.

The largest increase in business entities is registered each year in Długoleka (302 in 2010), Kały Wrocławskie (262), Kobierzyce (265), and Siechnice (218), while the smallest are in Jordanów Śląski (19) and Mietków (23).

The positive data regarding the amount of the unemployed in working age population is unfortunately accompanied by an increase in social pathologies. Local governments dedicate a substantial part of their incomes for the prevention of alcoholism. These expenses depend largely on the financial situation of each commune, but also on the extent of the problem. During 2005-10 the amount of money spent for the purpose rose in each of the analyzed communes. The highest amount, an alarming 1,289,229.00 PLN, was used in 2010 in the Kobierzyce commune, with less than 58,878.00 PLN spent in Jordanów Śląski.

Evaluation of the Environmental Aspects of Sustainable Development in the Community Spatial Policies

The results of the study are worrying, which is confirmed by the large amount of areas planned for new investments. In their spatial policies, the authorities of the communities directly sharing their border with Wrocław, especially Czernica, Kały Wrocławskie, and Siechnice, delin-

ate substantial amounts of the area to shift toward residential and industrial construction (Tables 3 and 4). These areas are currently used for agriculture. The population in each commune would have to multiply a number of times for the planned new areas for residential-service construction to be consumed.

Some difference can be observed in the manner of realizing the spatial policy in communities with and without environmental protection. The planned spatial development of Kały Wrocławskie is the only exception. Despite high environmental value, the indicators used in this study show the formulating of the spatial policy in this communities toward the development of residential and production functions.

The planned increase in areas for residential-services purposes per one resident is usually lower in communities located outside landscape parks.

Research on space planned for transformation for residential-service construction showed a significant increase in areas sealing off biologically active space. Including areas for economic activity (production, bases, storage), the amount in Siechnice reaches 62%, and 30% of the overall area in Czernica and Kały Wrocławskie. Once again, Kały Wrocławskie lands in the same group with unprotected communities.

The same indicator also is high in other communities located outside landscape parks, equaling about 25%. The amount of area planned for non-agricultural purposes in communities located within landscape parks is definitely smaller.

Communities located within landscape parks show better results in the evaluation of the sustainable development of the spatial policy. These include: Mietków, Jordanów, and Sobótka, which seem to show the most sensible management of free areas. The research showed a lack of planned compensatory actions to make up for free space seizure, e.g. through afforestations.

Conclusions

The general analysis of selected sustainable development evaluation indicators for communes in the Wrocław poviát showed a relatively stable state of the environment. Taking into account the increase in sanitary sewage system length in each communities, selective waste collection and the elimination of dust and gas pollution into the atmosphere by particularly pollutive plants, the danger level for the natural environment is decreasing. On the other hand, the level of water use, waste production and sewage production is on the rise. This is related to population growth in communities in the vicinity of Wrocław as well as the increase in housing estate areas.

Economic development in communities located near Wrocław results in larger budget income, lower unemployment rates, more financing for infrastructure, for culture and for green areas, but also in an increase in social pathologies (alcoholism).

Attempts to perform the evaluation using a division to environmentally protected communities, and communities outside natural protection zones proved unsuccessful. Additionally, it proved very hard to establish border values for the indicators, while arriving at a certain standardization is bound to fail due to the varied determinants of settlement unit development. Separate research should be undertaken regarding the standardization of indicators. The main goal of the research-evaluating spatial policy with regard to sustainable development-revealed alarming plans for the sustainable development of each function in the communes.

The study showed a strong increase in construction development areas in all communities when compared with the existing level of investment. The planned increase in areas for construction is a result of pressure from the local populace.

Certain changes can be found in the manner of realizing spatial policy between communities under environmental protection (Sobótka, Mietków, Jordanów Śląski) and those not protected (Czernica, Kobierzyce, Siechnice, Żórawina). The planned spatial development for Kały Wrocławskie is the only exception from this rule.

The results are conclusive – the authorities of the communities are planning too much area to be delineated for investment. The amount of terrains for residential and service construction is appalling (Siechnice – more than 60%). Taking into account the current manner of investment, Kały Wrocławskie holds a record – the authorities there delineated over 9 times more area for residential-service construction than is the current area used for housing estates. In order to limit such thoughtless decisions by local authorities, one

should introduce certain regulations, e.g. allowing the planning of new areas for housing up to an indicated limit per 1 resident, or with regard to the current level of investment. The local authorities also should be obliged to make environmental compensation, e.g. by planning afforestations.

Acknowledgements

Our research has been conducted as part of a research project titled “Ecosystem services in the environmental development of the Wrocław poviát communities in the context of communities located in landscape parks. Modeling changes – theoretical and practical assumptions.” Registration number: N N305 103840.

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