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EFFECTS OF SELECTED PRO-ENVIRONMENTAL PROJECTS IN THE REGIONAL DEVELOPMENT OF POLAND

ODDZIAŁYWANIE WYBRANYCH PROJEKTÓW PROŚRODOWISKOWYCH NA ROZWÓJ REGIONÓW – PRZYKŁAD POLSKI

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Summary: Pursuant to the assumptions of the strategic document of the European Union, namely the Europe 2020 Strategy, objectives were designated for Member States in the scope of the conducted development policy. Poland is one of the beneficiaries of the Operational Programmes and receives financial support from the EU The main aim of the article is to verify whether the tasks implemented in that scope affect the development of particular regions. The objective of the article is the determination of the effect of pro-environmental projects on the development of Polish voivodeships. The analysis covered initiatives implemented in the scope of Operational Programmes in the programming period 2014-2020. Moreover, the levels of the development of Polish voivodeships in the selected years were determined by taxonomic research methods by Z. Hellwig, The analysis of changes in the development levels of voivodeships and pro-environmental projects in the area of which investments and activities concerning the low-emission economy, renewable energy sources, thermo-modernization and recycling are carried out is indicative of several conclusions. The low share of projects related to recycling and strictly environmental protection is worrying. In all voivodeships, most pro-environmental projects financed by ROP concern thermomodernization.

Keywords: regional development, operational programme, pro-ecological programme.

Streszczenie: Zgodnie z założeniami Strategii Europa 2020 wobec państw członkowskich wyznaczono cele w ramach prowadzonej polityki rozwoju. Równocześnie Polska, jako jeden z beneficjentów programów operacyjnych, korzysta z pomocy finansowej UE, realizując projekty na rzecz środowiska,

gospodarki niskoemisyjnej, a szerzej − rozwoju zrównoważonego i trwałego. Celem artykułu jest zidentyfikowanie oddziaływania projektów o charakterze prośrodowiskowym na rozwój województw Polski. Analizie poddano inicjatywy realizowane w ramach programów operacyjnych w okresie programowania 2014-2020. Ponadto określono poziomy rozwoju województw Polski w wybranych latach. Zastosowano taksonomiczne metody badawcze Z. Hellwiga oraz metodę *desk research,* za pomocą której dokonano analizy projektów. Analiza zmian w poziomach rozwoju województw i projektów prośrodowiskowych wskazuje na kilka wniosków. Odsetek projektów proekologicznych jest bardzo mały w większości regionów. Niektóre województwa wdrażają te projekty w większym stopniu niż pozostałe (łódzkie, lubuskie, warmińsko-mazurskie). Niepokojący jest niski udział projektów związanych z recyklingiem i *stricte* ochroną środowiska. We wszystkich województwach najwięcej projektów prośrodowiskowych finansowanych w ramach RPO dotyczy termomodernizacji.

Słowa kluczowe: rozwój regionalny, programy operacyjne, projekty prośrodowiskowe.

1. Introduction

The important elements of reality included in the model of the impact of EU regional policy on the environmental dimension of socio-economic development are: economic activity and the natural environment. In turn, the main factor affecting the relationship between these elements is the intervention of EU regional policy which is implemented using projects. In this way, the implementation of projects directly affects the economy, which transforms in a way that is friendly to the natural environment. In turn, the expected result of these pro-environmental economic changes are positive changes in the condition and quality of the elements of the natural environment. Since Poland joined the European Union it has been implementing a common development policy. Each programming period (2004-2006, 2007-2013, 2014-2020) is assessed in terms of achieving the development goals set [Klimowicz 2014; Grzeszczyk 2006, pp. 28-29]. Pursuant to the assumptions of the Europe 2020 strategy, it is important to strive for sustainable development [*Europe 2020 − A strategy*... 2010], and the implementation instruments are operational programs, including regional operational programs, which is why it is important to undertake such a research topic. Both in earlier years and now in literature, researchers are undertaking the effort to determine the significance of cohesion policy in the development of Poland in various areas (see: [Grupa, Kozieł, pp. 20-30]). In addition, there are many evaluation reports that specify implemented projects, the source of their financing or the costs of investment tasks. In these studies, the main emphasis is placed on monitoring indicators, which are not always provided by persons submitting the application for co-financing (see: [Raport końcowy..., 2015, pp. 21-22]). This makes it difficult to assess the effects of project implementation.

The objective of the study was the determination of the effect of pro-environmental projects on the development of Polish voivodeships. The study concerns Polish voivodeships, and is based on the analysis of projects implemented in the scope of national and regional Operational Programmes in the period 2014-2020.

The primary source of information were data concerning projects financed in the scope of operational programmes used in desk research method. The next stage of research involved the determination of levels of development of voivodeships based on data from the public statistics of the Central Statistical Office, with the application of Z. Hellwig's development model method.

2. Importance of regional policy in the determination of directions of regional development

Socio-economic development is a complex and multi-aspect process. Due to this, the policy is within the interests of scientists and provides the basis for research in the scope of its effective functioning. The issue is discussed in many scientific articles [Dorożyński 2012; Stec 2011; Drela, Szymański (eds.) 2013] presenting attempts of determinining the effects of the implemented measures and the level of implementation of the assumed objectives in the framework of the conducted regional policy (Musiałkowska I., Wiśniewski M.). This is primarily shaped by the regional policy implemented by a given country, but in the case of Member States – also the policy of the European Union. It determines the main direction of development of the European Union, as reflected in the Cohesion Policy [*Wprowadzenie do unijnej*…]. Regulations concerning the determined development priorities, objectives, and directions of development are included in documents on European level as well as on the levels of particular countries. One of the most important documents affecting the direction of development is "Europe 2020 Strategy for smart, sustainable and inclusive growth". The document includes the primary goals to be achieved by Member States by 2020. One of them is limiting carbon dioxide emissions by at least 20% in comparison to the level from 1990, or if conditions allow, even by 30%. Moreover, the need for an increase in the contribution of renewable energy sources in total energy use to 20% is recognised, as well as the need for an increase in the effectiveness of energy use by 20% [*Europe 2020 – A Strategy*..., p. 12]. This objective points to the need for the implementation of tasks in the scope and investigation of the effects of financial expenditure for this objective.

The tool of implementation of the Cohesion Policy, namely the Operational Programme, is important. In the current programming period of the EU, nine national Operational Programmes and sixteen regional Operational Programmes function in Poland, implemented on the level of each voivodeship, as presented in Table 1.

Importantly, the Cohesion Policy and regional development are affected by the first six OPs from Table 1 and the Regional Operational Programmes. The projects implemented in the scope of these programmes were the subject of the analysis. The largest amounts of funding fell on the Programme: Infrastructure and Environment which finances most infrastructural projects, thus those related to high implementation costs. Regarding the Regional Operational Programme, the highest

Table 1. National and Regional Operational Programmes in Poland in the period 2014-2020

No.	Name of Programme	Financial resources allocated for the implementation of the objectives of the Programme (billion EUR)
1	Programme Infrastructure and Environment	27.4
2	Programme Smart Development	8.6
3	Programme Knowledge Education Development	4.7
4	Programme Digital Poland	2.2
5	Programme East Poland	2.0
6	Programme Technical Assistance	0.7
7	ETC	0.7
8	Rural Development	8.6
9	Fisheries and Sea	0.5
10	Regional Programme for the Lower Silesia Voivodeship	2.2
11	Regional Programme of the Kujawsko-Pomorskie Voivodeship	1.9
12	Regional Programme of the Lublin Voivodeship	2.2
13	Lubuskie Voivodeship Regional Programme	0.9
14	Regional Programme of the Voivodeship	2.2
15	Lesser Poland Voivodeship Regional Programme	2.9
16	Regional Programme of the Mazowsze Voivodeship	2.1
17	Regional Programme of the Opolskie Voivodeship	0.9
18	Regional Programme of the Subcarpatia Voivodeship	2.1
19	Regional Programme of the Podlaskie Voivodeship	1.2
20	Regional Programme for the Pomorskie a Voivodeship	1.9
21	Regional Programme of the Śląskie Voivodeship	3.4
22	Regional Programme of the Świętokrzyskie Voivodeship	1.4
23	Regional Programme of the Warmia-Masuria Voivodeship	1.7
24	Greater Poland Voivodeship Regional Programme	2.4
25	Regional Programme of the West Pomerania Voivodeship	1.6

Source: author's own work based on [www.funduszeeuropejskie.gov.pl].

amount is for the Małopolska Voivodeship Regional Programme (2.9 billion EUR) and the lowest for and the Regional Programme for the Lubuskie Voivodeship (0.9 billion EUR each).

3. Implemented projects in the scope of operational programmes – range of influence, types of investment, character of projects

The analysis was based on 34,641 projects financed in the scope of regional and six national operational programmes in Polish voivodeships. Pro-environmental projects included those particularly concerning measures related to investment and the development of renewable energy sources, thermomodernisation, and the implementation of low-emissions economy, but also related to measures for the protection of fauna and flora, and recycling (2,471 projects).

Among the considered national programmes, the objectives of the OP Infrastructure and Environment correspond most with the issues related to investment in renewable energy sources, thermomodernisation, and low-emissions economy. This does not mean, however, that this was the only programme constituting the primary source of financing of projects concerning the issue (Figure 1).

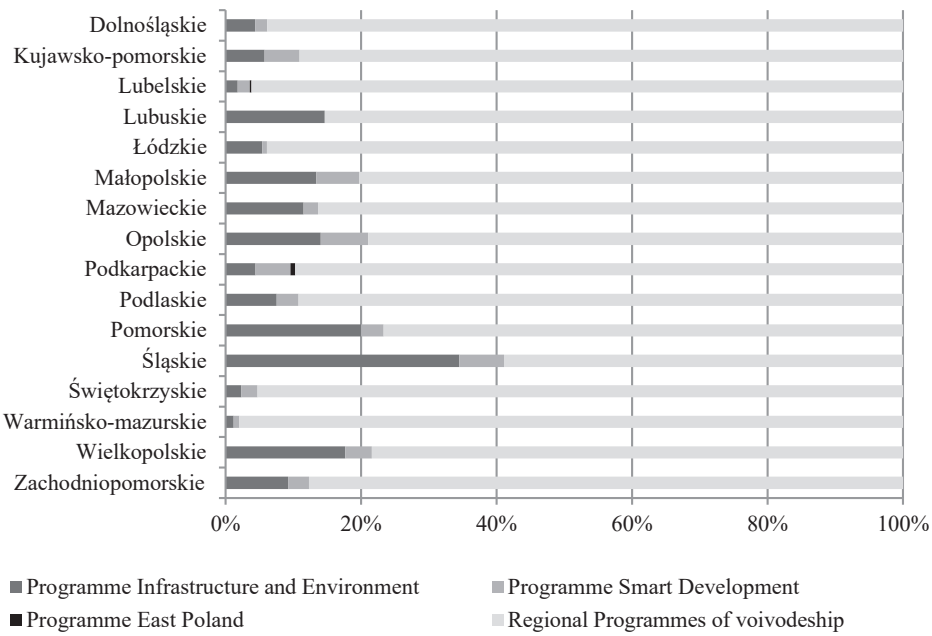

Figure 1. Contribution of Regional and National Operational Programmes in the implementation of pro-environmental projects by voivodeship

Source: author's own work.

A considerable share of the projects implemented in the scope of ROP in all voivodeships draws attention to the importance of the tool of the implementation of regional policy. ROP constitute medium-term development plans, and permit obtaining resources from Structural Funds. They are documents of an operational

character, determining the main directions of the development of voivodeships in a given financial perspective. The inclusion of the assumptions of ROP contributes to the implementation of development strategies of particular voivodeships, and their objective is an increase in regional competitiveness and promoting sustainable development in regions [Harasimowicz 2015, p. 43].

Figure 1 shows how large the share of environmental projects in all voivodeships are those financed from the ROP. In Warmia-Mazury, this funding source is the largest among all voivodeships (97%-environmental projects financed in the framework of ROP) and the smallest one is in Śląsk (58%).

The analysis of the projects was performed with a division into their range of influence, with a designation of projects with the following effect:

- point/place-based – project implemented only in one unit, i.e. enterprise, institution, building, and affecting the development of only that unit;
- network – the implemented project affects the development of a larger area (commune, city, region).

The implementation measures in the scope of projects in particular voivodships point to the predominance of those with a place-based range. Only the Łódzkie, Zachodniopomorskie, and Lubelskie Voivodeships are characterised by a considerably larger share of projects with a network range in comparison to the remaining ones (Table 2).

Table 2. Contribution of point-based and network range projects

Voivodeship	Point-based	Network
Łódzkie	59%	41%
Zachodniopomorskie	59%	41%
Lubelskie	67%	33%
Małopolskie	80%	20%
Wielkopolskie	80%	20%
Podkarpackie	81%	19%
Podlaskie	87%	13%
Dolnośląskie	88%	12%
Śląskie	90%	10%
Lubuskie	90%	10%
Kujawsko-pomorskie	91%	9%
Opolskie	91%	9%
Warmińsko-mazurskie	93%	7%
Świętokrzyskie	96%	4%
Pomorskie	97%	3%
Mazowieckie	99%	1%

Source: author's own work.

Such a situation encouraged further analyses based on thematic areas corresponding with the implemented projects. The point-based range of influence can point to the occurring needs of investment in a particular thematic area. In the majority of cases, projects concerning thermomodernisation investment adopt a point-based character of influence. This reflects the comparison of the contribution of projects in Figure 2. Voivodeships characterised by a high share of projects with a point-based range also have a substantial share of thermomodernisation investment among the projects from the remaining thematic areas. The Śląskie and Kujawsko-pomorskie voivodeships are the most diverse regions due to the implemented types of projects, for which more than half of the projects are those implemented for the benefit of low emissions economy, renewable resources, recycling and in the case of the latter, environmental protection.

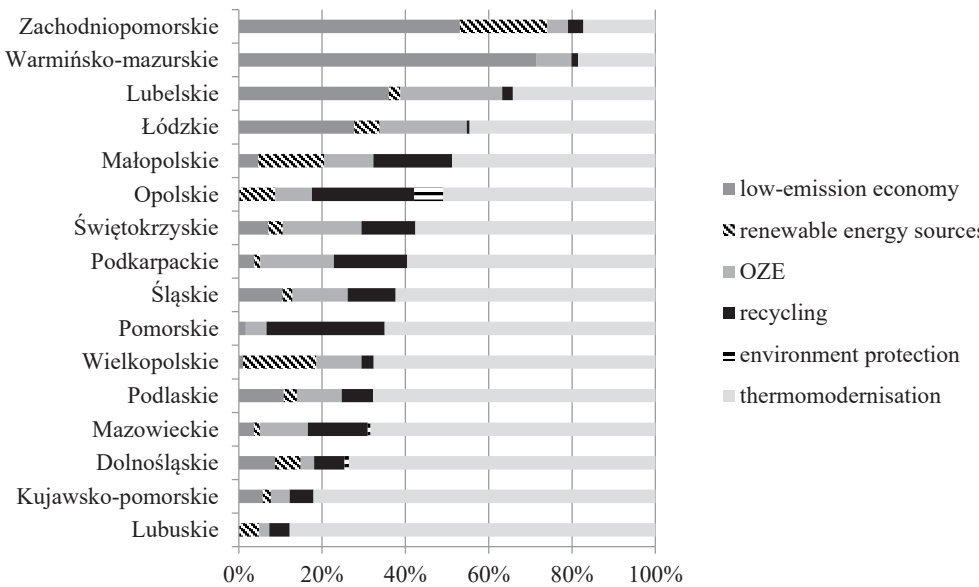

Figure 2. Contribution of pro-environmental projects influencing selected issues in the total number of projects by voivodeship

Source: author's own work.

The next stage involved the determination of the character of investment implemented in the scope of projects (hard/soft investment). Projects with the character of hard investment were dominated by infrastructural tasks involving undertaking activities particularly concerning technical infrastructure. The collected data showed the prevalence of such projects, while those with the character of soft

Table 2. Contribution of projects with a character of soft and hard investment in Polish voivodeships

Voivodeship	Projects with a character of investments	
	soft	hard
Lubuskie	1.25%	98.75%
Zachodniopomorskie	1.18%	98.82%
Warmińsko-mazurskie	1.45%	98.55%
Lódzkie	1.35%	98.65%
Lubelskie	2.30%	97.70%
Świętokrzyskie	2.35%	97.65%
Podlaskie	3.23%	96.77%
Pomorskie	3.28%	96.72%
Podkarpackie	3.68%	96.32%
Kujawsko-pomorskie	3.85%	96.15%
Wielkopolskie	3.92%	96.08%
Śląskie	4.88%	95.12%
Dolnośląskie	5.43%	94.57%
Mazowieckie	6.47%	93.53%
Opolskie	10.53%	89.47%
Małopolskie	16.54%	83.46%

Source: author's own work.

investment in particular included those involving training, increase in ecological awareness, but also the preparation of a patent, innovation, new technology, or financing tool. The contribution of this kind of projects was low in each voivodeship (Table 2). They represented a larger share only in the Opolskie and Małopolskie voivodeships.

4. Research methods

The determination of the variability of the level of development of Polish voivodships and their position in the ranking employed a method of linear ordering – the classic method of development model by Z. Hellwig. This method is often used to determine the levels of development of territorial units at different levels in research articles (voivodeships, 'powiats', communes) [Miłek, Paluch 2016; Warzecha 2013; Feltynowski, Nowakowska 2009] and government documents [Ministerstwo Gospodarki 2002].

The measure was first proposed by Z. Hellwig in 1968. It is normalised, and its values belong to an interval [0.1] (the final values may differ slightly from the limit values, e.g. –0.05).

The development model method by Hellwig permits linear ordering of objects in a way that those with a lower level of development are ascribed a lower value (closer to zero – the bottom threshold of the interval), and objects with a higher level are ascribed values closer to one (the upper threshold of the interval). Each studied object is described with a set of diagnostic variables with a character of stimulants or destimulants. In Hellwig's method, the aggregate measure is calculated as a synthetic index of distance of a given object from the theoretical model of development. The development model, i.e. an abstract object, constitutes a hypothetical voivodeship with the best (highest) observed variable values [Hellwig 1968, p. 4]. The study was performed in the following stages:

- selection of the set of variables (source: list of indicators of sustainable development of the Central Statistical Office – GUS);
- development of a taxonomic measure of development by means of Hellwig's measure method;
- development of a ranking of voivodeships and their division into classes.

The determination of the level of development of voivodeships in particular dimensions employed a total of 48 indices for two moments in time: 2013 – the last year before the implementation of the projects, and 2016 as the last year with available data. The data were obtained from the Bank of Local Data of the Central Statistical Office (BDL GUS). A final set of 14 variables was obtained for 2013 and 2016 for the determination of the economic development of the voivodeships. In the case of social development, 20 indices were obtained. The level of development in the environmental aspect was determined based on 14 indices (Table 3) . The number of final indices was determined by the elimination of those for which the variability coefficient was lower than 10%, and at the next stage the indices were characterised by a high degree of correlation exceeding 0.7.

Table 3. List of indices

Indicator	Economic aspect	Coefficient of variation
1	2	3
x1	Gross Domestic Product *per capita* (current prices)	25%
x2	investment expenditure *per capita* (current prices)	32%
x3	employment rate by education (junior high and lower)	14%
x4	natural persons providing business activity per 100 persons at productive age	16%
x5	share of innovative enterprises by sector in total enterprises (industry sector)	14%

1	2	3
x6	share of innovative enterprises by sector in total enterprises (services sector)	51%
x7	share of sold production of new or considerably improved products introduced to the market over the last three years in comparison to the value of total sold production	37%
x8	length of express roads and motorways per 100 km^2	61%
x9	length of operated railway per 100 km^2	44%
x10	length of bicycle lanes (per 10 k km^2)	37%
x11	length of bicycle lanes (per 10 k people)	37%
x12	share of surface area of ecological agricultural farms (with a certificate) in total arable land	94%
x13	use of mineral fertilisers per 1 ha of arable land	29%
x14	total livestock density in large animal units per 1 ha of arable land	48%
Social aspect		
x15	natural growth per 1000 people	70%
x16	infant deaths per 1000 live births	16%
x17	share of deaths by selected causes in total number of death (cardiovascular diseases %)	11%
x18	share of deaths by selected causes in total number of deaths (respiratory diseases %)	25%
x19	suicides per 10 k residents	22%
x20	balance of permanent migration of persons at productive age per 10 k people at productive age	52%
x21	share of persons in households benefiting from community-based social service in total population. Total (%)	26%
x22	average monthly disposable income per 1 person in a household	92%
x23	adults participating in education and training	33%
x24	share of persons aged 18-59 constituting participants of households excluding employed persons in total participants of households	18%
x25	share of long-term unemployed persons (longer than 1 year) in total registered unemployed persons	11%
x26	rate of employment of persons with disabilities	19%
x27	use of media in households in a year per 1 resident (water)	13%
x28	average monthly consumption of vegetables per 1 person	10%
x29	share of registered long-term unemployed persons (longer than 1 year) aged 55-64 in total unemployed persons aged 55-64	12%

Table 3, cont.

1	2	3
x30	number of medical doctors entitled to practice the profession per 10 k residents	21%
x31	victims of accidents at work per 1000 employed persons	17%
x32	crimes recorded by the police with completed preliminary proceedings (per 1000 residents)	20%
x33	victims of road accidents per 100 k registered vehicles (fatalities)	22%
x34	victims of road accidents per 100 k registered vehicles (injuries)	38%
Environmental aspect		
x35	carbon dioxide emissions from particularly polluting plants	96%
x36	share of renewable energy in total electricity production	107%
x37	expenditures for fixed assets for environmental protection related to electricity saving per 1 resident	56%
x38	emission of air pollutants from particularly polluting plants (gas)	96%
x39	emission of air pollutants from particularly polluting plants (dust)	71%
x40	exploitable reserves of groundwaters – increase or decrease in comparison to the previous year	177%
x41	share of surface area of renewal and afforestation in total area of forests	19%
x42	share of surface area of arable land in total area	15%
x43	share of surface area of Natura 2000 areas in total area (share of Special Protection Areas)	67%
x44	share of surface area of Natura 2000 areas in total area (share of Special Areas of Conservation in total area)	61%
x45	share of legally protected areas in total area	39%
x46	municipal waste from selective collection to total municipal waste collected in a year	16%
x47	amount of mixed municipal waste from households collected in a year per 1 resident	23%
x48	share of treated municipal and industrial sewage in total sewage requiring treatment	10%

Source: author's own work.

The set of adopted diagnostic variables was divided into two subsets: stimulants and destimulants. They affect the synthetic variable in two different directions. Stimulant (S) is a measure whose high values are desirable from the point of view of aggregate characteristics, and cause an increase in its value. In the case of

destimulants (D) the situation is the opposite, and high values of variables cause a decrease in the level of the value of the aggregate measure [Grabiński, Wydymus, Zeliaś 1989]. Subsequent stages of the research were carried out in accordance with Hellwig's method [www.unesdoc.unesco.org].

5. Levels of development of voivodeships in the economic, social, and environmental aspect

From the research point of view, it was important to identify whether the implemented projects with a specified pro-environmental character contribute to changes in the level of development of voivodeships with a division into three basic dimensions of development: social, environmental, and economic. Z. Hellwig's development model method permitted the determination of levels of development of voivodeships for selected years in each dimension, and the analysis of changes occurring in the study period. First, it was important to identify the changes in the distance of voivodeships from the model object, as presented in the radar graphs (Figures 3 to 5). The higher the value for a given voivodeship, the more approximate the object's development is to that of the model object.

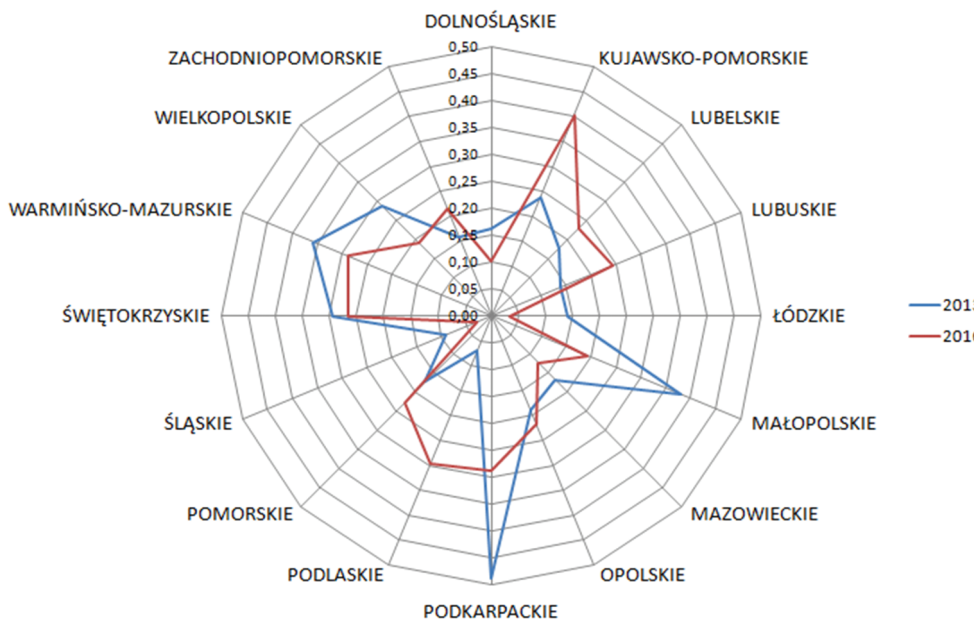

Figure 3. Change in the value of the measure of development obtained by the voivodeships in the economic dimension

Source: author's own work.

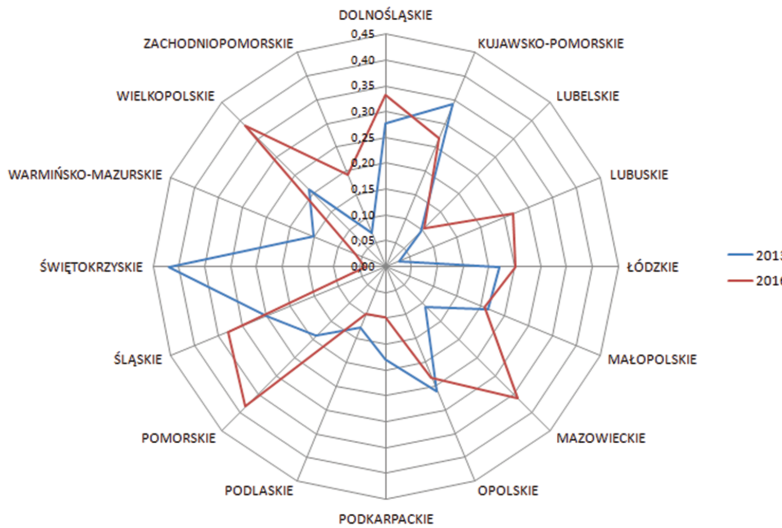

Figure 4. Change in the values of the measure of development obtained by the voivodeships in the social dimension

Source: author's own work.

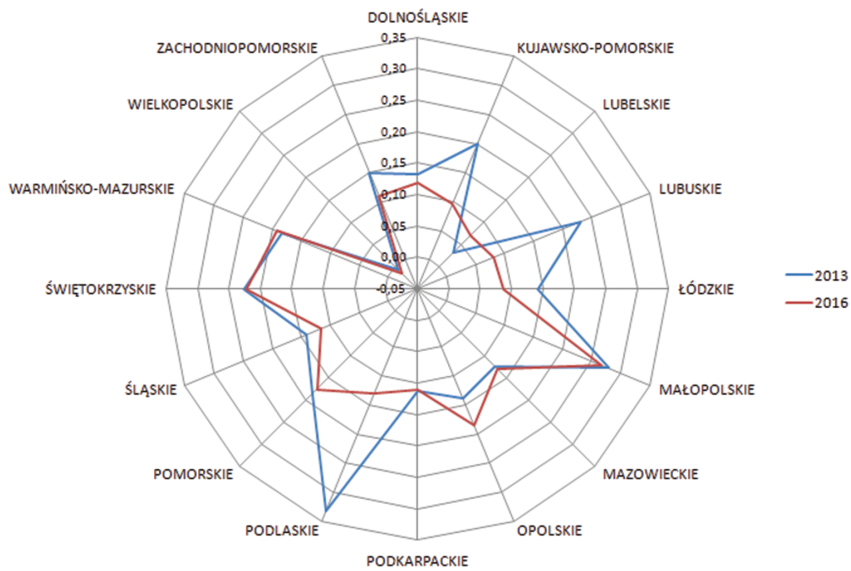

Figure 5. Change in the values of the measure of development obtained by the voivodeships in the environmental dimension

Source: author's own work.

Among the analysed dimensions of development, the most favourable situation is manifested in the economic dimension where the voivodeships are more approximate to the model object than in the remaining dimensions. The synthetic analysis of changes in the values of the measure of development obtained by the voivodeships is presented in Table 4.

Table 4. Changes of the value of Hellwig's development index in particular dimensions of development

Voivodeship	Development dimension		
	economic	environmental	social
Dolnośląskie	+	–	–
Kujawsko-pomorskie	–	+	–
Lodzkie	+	–	–
Lubelskie	–	–	+
Lubuskie	+	+	–
Małopolskie	–	–	–
Mazowieckie	+	–	–
Opolskie	–	+	+
Podkarpackie	–	–	–
Podlaskie	+	+	–
Pomorskie	+	+	–
Śląskie	+	–	–
Świętokrzyskie	–	–	–
Warmińsko-mazurskie	–	–	+
Wielkopolskie	+	–	–
Zachodniopomorskie	–	+	–

+ − increase of value of Hellwig's development index, – − decrease of value of Hellwig's development index.

Source: author's own work.

These data show that more than 56% of voivodeships have better value only in one dimension. The Lubuskie, Opolskie, Podlaskie, and Pomorskie voivodeships approached the model object in two dimensions. This position shows the positive development trends in more than less regions, so it is interesting to look into the cause of this situation.

Another aspect important for the analysed issue was the determination of the changes in the positions obtained by the voivodeships in the ranking. For this purpose, the positions occupied in 2013 and in 2016 were compared.

The greatest changes in the scope of improvement of the positions in the ranking occurred in the social dimension, where half of the voivodeships occupied better

positions in the ranking. The smallest changes (in the positive way) concerning the analysed issue occurred in the environmental dimension (Table 5).

Table 5. Positions of voivodeships in the ranking in 2013 and 2016 in three dimensions of development

Voivodship	Economic dimension		Environmental dimension		Social dimension	
	2013	2016	2013	2016	2013	2016
Dolnośląskie	2	4	11	14	12	8
Kujawsko-pomorskie	9	6	6	1	5	12
Lubelskie	16	12	8	7	15	15
Lubuskie	6	7	14	6	3	14
Lodzkie	8	8	13	15	10	13
Małopolskie	12	10	2	11	2	1
Mazowieckie	7	3	10	13	13	7
Opolskie	5	9	7	9	11	4
Podkarpackie	15	14	1	4	14	10
Podlaskie	14	13	16	2	1	6
Pomorskie	4	2	9	8	6	5
Śląskie	3	5	15	16	9	9
Świętokrzyskie	13	16	4	5	4	2
Warmińsko-mazurskie	11	15	3	3	7	3
Wielkopolskie	1	1	5	12	16	16
Zachodniopomorskie	10	11	12	10	8	11

– higher positions of voivodeship on the list.

Source: author's own work.

6. Conclusions

The analysis of changes in the levels of development of voivodeships and pro-environmental projects in the scope of which the implemented investment particularly concerns low-emissions economy, renewable energy sources, thermomodernisation, and recycling, points to several conclusions. The share of pro-ecological projects is very low in the majority of regions. Some voivodeships implement the projects to a greater degree than others (Lubusz, Warmia-Mazury). The number of projects, however, is not a condition of improvement in particular dimensions, particularly the environmental one. Projects with a hard character are predominant, and they are mainly infrastructure investments. A large share of such projects is related to the

thematic area they concern. The majority of projects involves investment related to the thermomodernisation of buildings, but a large contribution also concerns investment in photovoltaic installations of different sizes (investments in micro--installations are predominant, but measures for the development of energy farms also occur). The range of influence of projects is more of a point-based than network character. This does not mean that it does not affect regional development in the environmental aspect. Many point-based investment can with time gain a network character, when they are implemented in a strict conditions. In regions with more projects of a network character, a tendency is observed for the improvement of the level of development in the environmental dimension, although it is not a hard and fast rule. Voivodeships showing an improvement of the position in the ranking (Zachodniopomorskie, Lublin, Lubuskie) have a higher contribution of projects with a network range. Some voivodeships, however, occupied better positions in 2016 than in the base year, and have a low share of projects with the discussed character (Pomorskie, Podlaskie).

Pro-ecological initiatives do not evidently translate into the development of regions in particular dimensions. No correlation was observed between the character of a project (soft, hard investment) or the issue as to what the scope they are implemented and changes in the level of development in particular dimensions of development. This does not mean that these initiatives should not be implemented. It should be considered, however, in what scope pro-environmental projects could stimulate the level of regional development, and whether the specified objectives of projects always correspond with the occurring needs reported by local communities, cities, or communes. The search for the answer to the question should be continued as port of more thorough research.

The most evident effects might be visible after 2021 due to the fact that the changes resulting from the implemented measures are not immediate. It should be emphasised that the transformations in the natural environment, such as improvement of the quality of air, do not occur immediately, and require a longer period of time.

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