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INVESTMENT OUTLAYS ON NATURE PROTECTION IN THE CONTEXT OF THE SHARE OF AREAS OF HIGH ENVIRONMENTAL VALUE IN THE REGIONS OF POLAND

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ABSTRACT: The aim of the study is to determine whether there is a relationship between the value of investments made for nature protection and the area of legally protected areas in Poland. The research problem concerns investment outlays incurred for nature protection in relation to the surface of areas with high natural values in Poland, taking into account the division into voivodeships in the years 2002-2021. In general, the area of legally protected areas in Poland did not show high variability in the analysed period, while the assessment of the relationship between the variables showed differences between voivodships. The results of the statistical analysis showed that there is a positive relationship between investment outlays and the share of legally protected areas and that the level of investment outlays incurred for nature protection is not proportional to the share of legally protected areas.

KEYWORDS: investment outlays, environmental protection, environmentally valuable areas, natural areas under legal protection, natural value of the area

Introduction

Taking into account the intensifying processes of urbanisation and intensification of economic activity, the role of protected areas in maintaining the high quality of the natural environment is increasing. These areas are gradually becoming the only enclaves where individual plant and animal species and entire ecosystems have a chance to survive. Therefore, there is a tendency to enlarge protected zones in order to preserve valuable natural and landscape areas for future generations. Depending on the form of legal protection, these areas perform residential and economic functions, especially tourist ones. Therefore, it is particularly appropriate for local authorities to care for the high quality of the natural environment.

An overview of the literature

The area of natural value is sensitive and vulnerable to transformation and is characterised by significant natural values (Cieszewska, 2008). Dobrzańska (2005) defines an area rich in natural values as a fragment of land or sea with high biodiversity, which is managed in such a way as to protect this diversity. Szczepanowski (2007) completes this definition by adding that in naturally valuable areas, biodiversity is an important and dominant factor of economic activity or significantly limits the conventional ways of developing such land.

Distinguishing environmentally valuable areas in the environment is the first step to further actions aimed at covering them with legal protection. Therefore, each protected area is at the same time an area of high natural value, but not all naturally valuable areas have statutory objectives, rules and forms of protection. Legal protection covers areas that are distinguished by outstanding natural values on a national scale, which in Poland is detailed in the legal act of July 13, 2023 (Obwieszczenie, 2023).

Protected areas should be protected to the extent necessary to maintain the function of natural capital and restrictions and be used rationally because they are of great socio-economic importance. It is obvious that the basic function of protected areas is the protection of natural resources. All other economic and non-economic activities should be subordinated to this function (Zielińska, 2014). The share of legally protected areas with special natural values determines the existing natural resources and the natural and landscape diversity, as well as the biodiversity of a given region. These areas, generally with a higher quality of the environment, are characterised by a higher development potential, in particular for the industry related to the organisation of leisure time. The need to rest in areas distinguished in terms of nature is particularly felt by societies that live in highly urbanised areas (Szyda & Karasiewicz, 2017).

Environmental protection is financed by many instruments and institutions. The most important instruments and institutions for financing the environmental protection system in Poland include government budget funds and local governments (voivodeships, poviats and communes), own funds of enterprises and households, foundations and agencies, banks and foreign funds, including European Union funds in form of various programs (Pluskota, 2007).

Research methods

The research problem addressed in the study concerns investment outlays incurred for nature protection in relation to the areas of high natural value in Poland, taking into account the division into voivodeships. In connection with the undertaken research problem, the following detailed objectives of the paper were formulated:
- Assessment of the diversification of investment outlays incurred for environmental protection in the context of a surface of legally protected areas in individual regions of Poland.
- Evaluation of the impact of a surface of legally protected areas on the investment outlays incurred for nature protection in various regions of Poland.
- Determination of the impact of the area of protected areas on investment outlays incurred for environmental protection per 1.000 inhabitants in various regions of Poland.

In connection with the research objectives, the following research questions were prepared:
- Does the surface of a high natural value area affect the investment outlays incurred for nature protection?
- Does the area of legally protected areas per 1.000 inhabitants affect the investment outlays incurred for nature protection per 1.000 inhabitants?
- Is the scale of investment outlays incurred for nature protection proportional to the surface of a high natural value area in the selected regions of Poland?

Taking into account the objectives of the paper, the following research tasks were defined:
- Analyzing the diversification of investment outlays incurred for environmental protection in the context of the area of environmentally valuable areas in individual regions of Poland.
- Determining the relationship between the value of investment outlays incurred for nature protection and the surface of legally protected areas in Poland.
- Examination of the relationship between investment outlays incurred for nature protection per 1.000 inhabitants and the surface of legally protected area per 1,000 inhabitants in Poland.

The time range of the research covers the years 2002-2021. The investment outlays incurred for nature protection, and the surface of legally protected areas in Poland were subjected to a detailed analysis. The indicator of investment outlays incurred for nature protection per 1.000 inhabitants, and the indicator of the surface of legally protected areas per 1.000 inhabitants were also used. The detailed analysis was performed on a regional basis according to the administrative division of Poland into voivodships.

An additional issue was to determine the dynamics of changes in the value of investment outlays in the field of nature protection in Poland and in voivodeships in the context of the surface of the protected area. The assessment was made using dynamic ratios, assuming the values in the base year as 100%. A single-base comparison over time was used, which determines changes in the value of the phenomenon in a given period in relation to the previously established base period (Nowak, 2005; Bednarski et al., 2003). The dynamic approach, as the study of the volatility of the subject of study over time, is the analysis of its imbalance and changes of states. They can be treated as a series of static partial equilibria in the following years (Kuciński, 2010).

Data from the Central Statistical Office and available literature on the subject were used for the detailed analysis. The data was compiled using a descriptive, comparative and analytical method, and the results were presented in charts and tables (Stachak, 2006). A statistical method was also used to develop the data to assess the relationship between the variables by performing a linear correlation analysis. This analysis describes a statistical collectivity called two-dimensional, considered in terms of two features (x, y). The strength of the interdependence of the two variables was measured using the Pearson linear correlation coefficient, which is marked with the r_{xy} symbol and takes values in the range (-1.1). When interpreting Pearson's linear correlation coefficient, it should be remembered that a coefficient value close to zero does not always mean no dependence but only no linear dependence. The sign of the correlation coefficient informs us about the direction of correlation and its absolute value about the strength of the relationship (Stanisz, 1998). The analysis of investment outlays in the context of the share of the area of protected areas using Pearson's simple correlation coefficient, which was used to describe the strength of the correlation of features and the direction of the correlation. A 5% inference error and the associated significance level of $p < 0.05$ were assumed, indicating the existence of statistically significant differences or relationships. In the statistical analysis, the following scale was adopted to assess the strength of correlation (Stanisz, 1998):

- $r_{xy} = 0$ the variables are not correlated,
- $0.01 < r_{xy} < 0.1$ very weak correlation,
- $0.1 \leq r_{xy} < 0.3$ weak correlation,
- $0.3 \leq r_{xy} < 0.5$ average correlation,
- $0.5 \leq r_{xy} < 0.7$ high correlation,
- $0.7 \leq r_{xy} < 0.9$ very high correlation,

- 0.9 ≤ r$_{xy}$ < 1 almost full correlation.

The direction of correlation, i.e. the type of dependence, was determined by taking the following intervals: r > 0 – positive correlation (the value of X increases, so does Y), r = 0 – no correlation (X increases, Y sometimes increases and sometimes decreases) and r < 0 – correlation negative (X increases, Y decreases).

Results of the research

The total area of legally protected areas in Poland does not show much variability in the analysed period. However, there is a visible variation depending on the region. Figure 1 presents the average regional structure of legally protected areas in Poland, broken down by voivodeships in the years 2002-2021. We can observe that the highest share in the total surface of legally protected areas in Poland is in the Warmińsko-Mazurskie (11.2%), Mazowieckie (10.4%) and Wielkopolskie (9.2%) voivodeships, and the lowest share of legally protected areas was recorded in the Opolskie (2.5%), Śląskie (2.7%) and Łódzkie (3.4%) voivodeships.
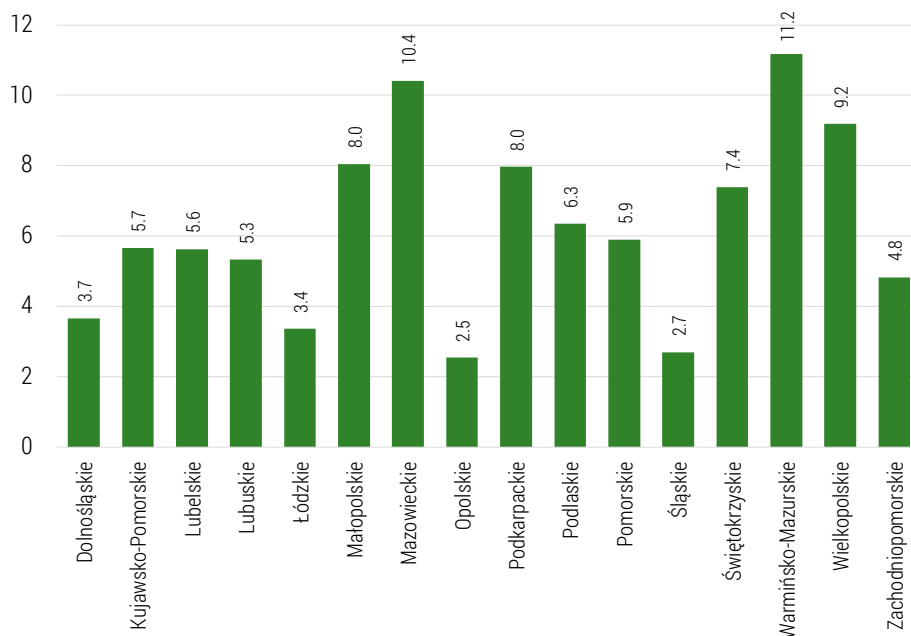

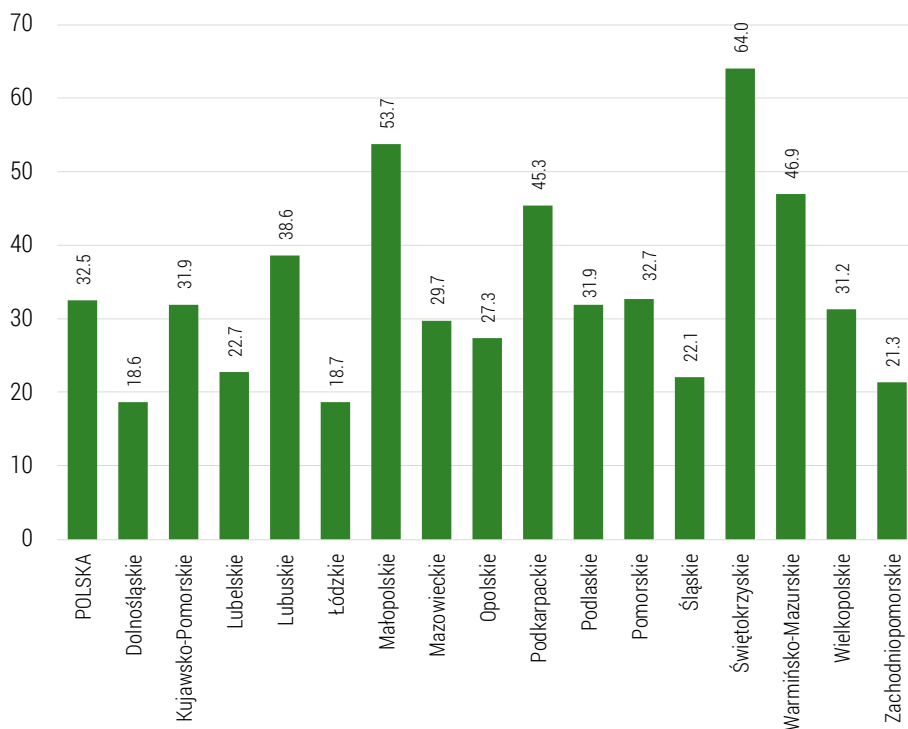Figure 1. The structure of legally protected areas in Poland by voivodship (2002-2021)

Figure 2. Share of legally protected area in the total area of Poland (2002-2021)

The situation is completely different when we determine the average share of legally protected areas in the total area (Figure 2). In Poland, the share of protected areas with special natural values is 32.5%. In relation to the total area, the largest share of the legally protected area was found in Świętokrzyskie (64.0%), Małopolskie (53.7%) and Podkarpackie (45.3%) voivodeships. At the same time, in the Świętokrzyskie Voivodship, the highest share of investment outlays incurred for nature protection was observed in relation to investment outlays in the national economy, which amounted to about 7%. The lowest share of investment outlays, over 3%, was recorded in the Mazowieckie Voivodeship (Figure 3).

It can be concluded that the area of a legally protected area largely depends on the natural topography and, thus, on the location of a given area. The data analysed confirms that the surface of legally protected areas in Poland in the years 2002-2021 is characterised by very low dynamics of changes. The dynamics of changes in investment outlays incurred for nature protection at the same time is the opposite. Assuming the value of outlays on nature protection in the base year as 100%, it turns out that in 2021, their value increased by over 80%. Of course, there is a differentiation in the dynamics of changes in individual
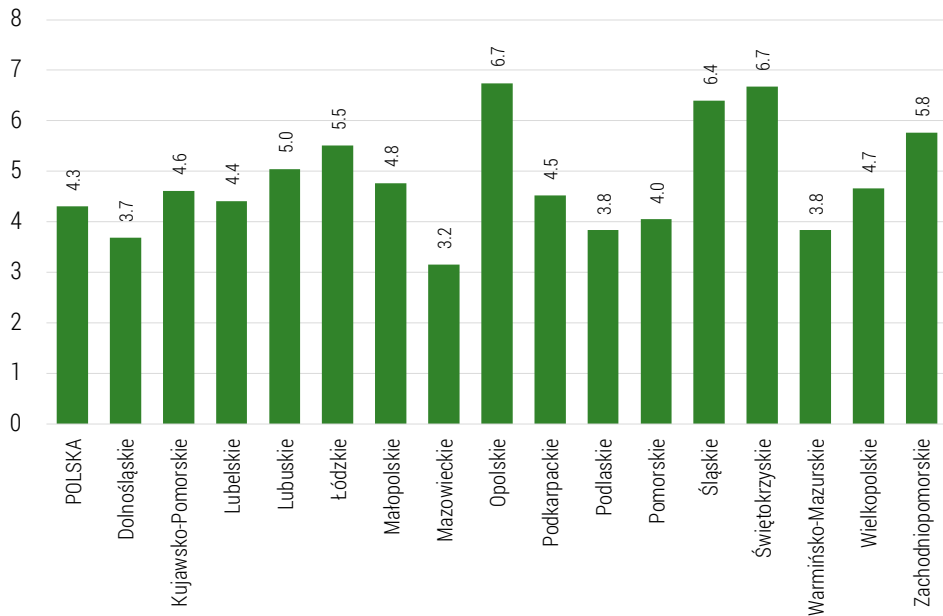
Figure 3. Share of investment outlays incurred for nature protection in investment outlays in the national economy of Poland (2002-2021)
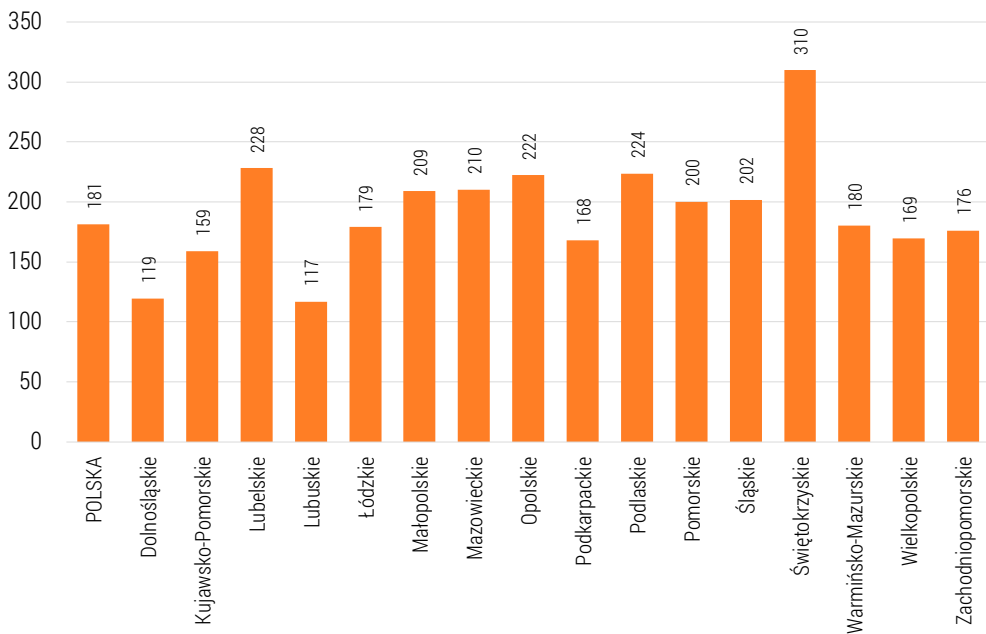

Figure 4. Dynamics of changes in investment outlays on nature protection in Poland according to voivodeships division (2002-2021)

voivodeships. In the Świętokrzyskie Voivodship, investment outlays increased by about 210%, and in the Lubelskie Voivodship by about 128%. The lowest increase in the value of investment outlays incurred for nature protection was observed in Lubuskie (approx. 17%) and Dolnośląskie (over 19%).

The surface of legally protected areas in Poland and in voivodeships was additionally calculated per 1,000 inhabitants (Figure 5). The largest area of legally protected area per 1,000 inhabitants is in the Warmińsko-Mazurskie Voivodship (over 793 ha), Świętokrzyskie (594 ha) and Podlaskie (540 ha). The least legally protected area per 1,000 inhabitants are in the Śląskie (59 ha), Dolnośląskie (128 ha) and Łódzkie (135 ha) voivodeships. It can be concluded that the value of the investment outlays indicator depends both on the population in a given voivodship and on the share of legally protected area in a given region. Voivodeships characterised by the lowest level of investment outlays per 1.000 inhabitants are characterised by a relatively low share of legally protected area (about 20%), while voivodeships with the highest indicators have a much higher share of area with higher natural values.
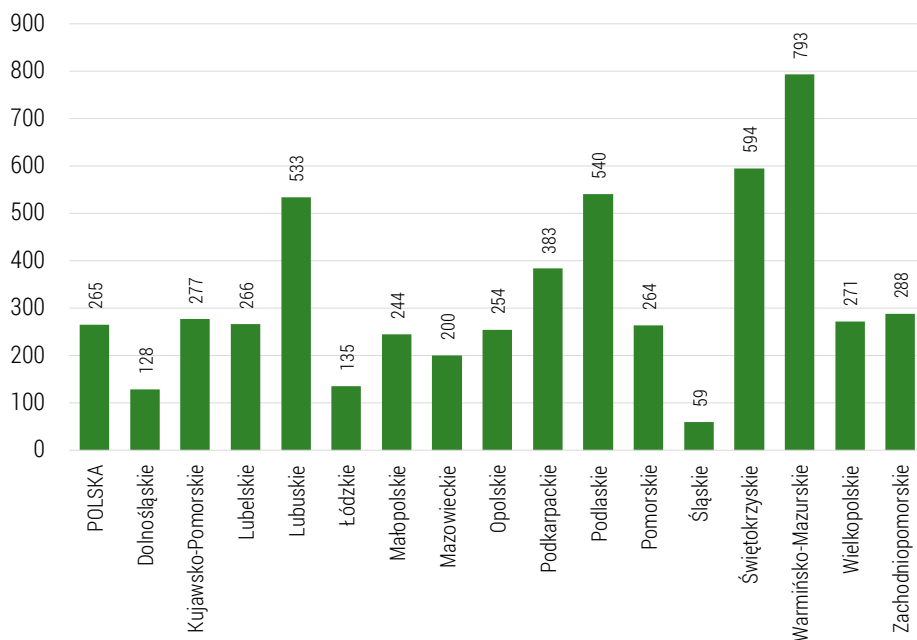

Figure 5. Surface of legally protected area in Poland and voivodeships in hectares per 1.000 inhabitants (2002-2021)

In the next step, the amount of investment outlays incurred for nature protection in Poland and voivodships per 1,000 inhabitants was analysed (Figure 6). The highest average investment outlays in the analysed years were incurred in Śląskie (PLN 316/1.000 people) and Łódzkie (PLN 303/1.000 people). At the

same time, these voivodships were characterised by the lowest rate of protected area per 1.000 people. The smallest value of the investment outlays for nature protection was recorded in Warmińsko-Mazurskie Voivodeship (PLN 164/1.000 people) and Lubelskie Voivodeship (PLN 179/1.000 people).
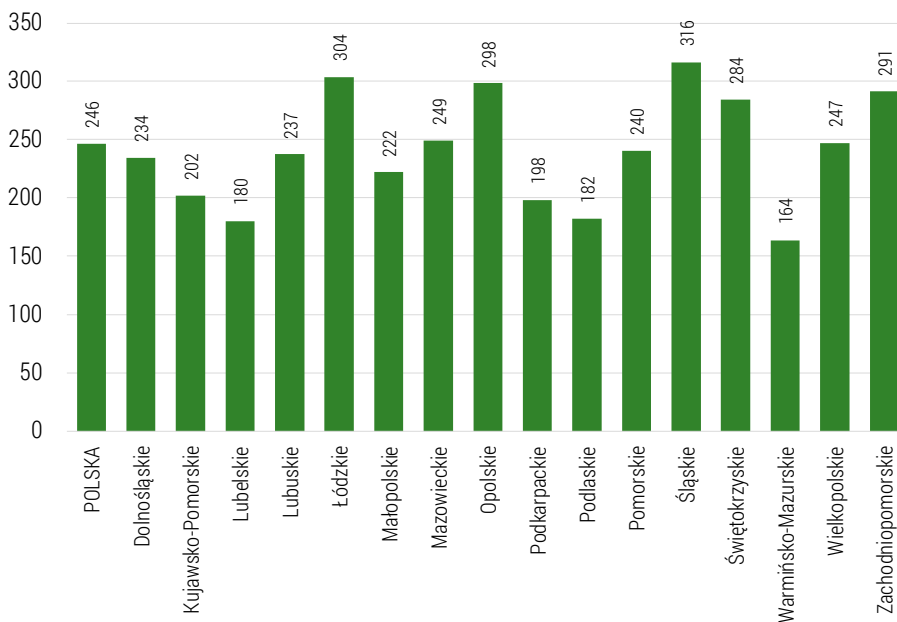

Figure 6. Amount of investment outlays on nature protection in PLN per 1.000 inhabitants (2002-2021)

The assessment of the relationship between the variables, using the linear correlation analysis, made it possible to determine the strength of the interdependence of the two variables, expressed by the Pearson linear correlation coefficient. The result of the correlation assessment for Poland showed a very weak correlation, which proves that the relationship between the analysed variables is very weak, while the direction of the correlation is positive. Much more information is obtained by carrying out a regional analysis (Table 1).

In order to check whether there is a correlation between the share of legally protected area in the total area and the share of investment outlays incurred for nature protection in investment in the national economy in Poland and in voivodships, the Pearson linear correlation was performed. It turned out that in 6 voivodeships, statistically significant results with a weak relationship were obtained. Positive correlations were observed in the following voivodships: Małopolskie (r = 0.126), Mazowieckie (r = 0.242), Wielkopolskie (r = 0.222) and Warmińsko-Mazurskie (r = 0.113). This means that an increase in the value of one variable causes an increase in the value of the other variable in these regions.

On the other hand, the negative direction of weak correlations was observed in the Lubuskie (r = -0.043) and Łódzkie (r = -0.215) voivodships, which indicates that in these voivodships an increase in the value of one variable is associated with a decrease in the value of the other variable.

Statistically significant results with the strength of the relationship at the average level were achieved in three voivodeships: Podlaskie (r = 0.443), Świętokrzyskie (r = 0.433) and Zachodniopomorskie (r = -0.430). Relationships with a positive direction in the Podlaskie and Świętokrzyskie voivodeships indicate that with the increase in the share of protected areas, the share of investment outlays for nature protection in these regions increases. On the other hand, a significant negative correlation occurred in the Zachodniopomorskie Voivodeship, i.e. the increase in one variable is followed by a decrease in the other variable.

The strongest positive relationship between the share of legally protected area in the total area and the share of investment outlays incurred for nature protection in investment outlays in the national economy occurred in Podkarpackie (r = 0.584) and Dolnośląskie (r = 0.511) voivodeships. Due to the fact that this is a positive correlation, i.e. with the increase in the share of the protected area, the share of investment outlays in total outlays in these voivodships increases, or vice versa. Noteworthy is the only highly significant negative statistical correlation in the Opolskie Voivodeship (r = -0.688), i.e. as one feature increases, the other decreases. In the remaining voivodships, the correlations indicate a very weak relationship between the selected features, and thus, in the overall assessment, they were not significant.

It is worth paying attention to the coefficient of determination in all voivodeships. The calculations show that we are not dealing with a perfect fit for the linear model. This is evidenced by the not very high R^2 coefficient, which was below 0.5. This means that the dependence in individual regions of Poland explains less than 50% of the variability. This may not be enough in the context of possible future forecasts that may turn out to be inaccurate. However, if we only want to understand the relationships between variables, lower R^2 values are acceptable.

The results of the correlation of investment outlays for nature protection in relation to the surface of legally protected area per 1.000 inhabitants in Poland in the years 2002-2021, presented in Table 2, showed the existence of an average correlation. This confirms that the strength of the relationship between the analysed variables is average. The direction of the correlation is negative in this case. The differentiation of dependencies is visible after the analysis of correlations for individual voivodeships.

Table 1. Correlation of investment outlays on nature protection in investment outlays in the national economy and the share of legally protected area in the total area in Poland and voivodeships (2002-2021)

Territory	r (x, y)	r²	t	p
Poland	0.087	0.008	0.370	0.716
Dolnośląskie	0.511	0.261	2.522	0.021
Kujawsko-Pomorskie	0.054	0.003	0.230	0.821
Lubelskie	-0.214	0.046	-0.931	0.364
Lubuskie	-0.043	0.002	-0.184	0.856
Łódzkie	-0.215	0.046	-0.934	0.363
Małopolskie	0.126	0.016	0.539	0.596
Mazowieckie	0.242	0.059	1.058	0.304
Opolskie	-0.688	0.473	-4.018	0.001
Podkarpackie	0.584	0.341	3.053	0.007
Podlaskie	0.443	0.196	2.098	0.050
Pomorskie	0.046	0.002	0.194	0.849
Śląskie	0.018	0.000	0.076	0.940
Świętokrzyskie	0.433	0.187	2.038	0.057
Warmińsko-Mazurskie	0.113	0.013	0.481	0.636
Wielkopolskie	0.222	0.049	0.965	0.347
Zachodniopomorskie	-0.430	0.185	-2.020	0.059

Explanations and abbreviations to Table 1:
the determined correlation coefficients are significant with p < .05000. N = 20 (missing data were removed by chance),
r (x,y) – Pearson's coefficient,
r² – coefficient of determination,
t – the value of the "t" statistic examining the significance of the correlation coefficient,
p – the value of the test probability "p".

Table 2. Correlation of investment outlays on nature protection and the surface of legally protected area per 1.000 inhabitants (2002-2021)

Territory	r (x, y)	r²	t	p
Poland	-0.490	0.240	-2.387	0.028
Dolnośląskie	-0.008	0.000	-0.036	0.972
Kujawsko-Pomorskie	-0.130	0.017	-0.557	0.584
Lubelskie	0.612	0.375	3.284	0.004
Lubuskie	-0.256	0.065	-1.122	0.276
Łódzkie	0.653	0.427	3.661	0.002
Małopolskie	-0.488	0.239	-2.375	0.029
Mazowieckie	-0.678	0.459	-3.909	0.001
Opolskie	0.569	0.323	2.933	0.009
Podkarpackie	-0.492	0.243	-2.401	0.027
Podlaskie	0.481	0.231	2.326	0.032
Pomorskie	-0.714	0.509	-4.322	0.000
Śląskie	0.550	0.302	2.793	0.012
Świętokrzyskie	0.419	0.175	1.956	0.066
Warmińsko-Mazurskie	-0.152	0.023	-0.651	0.523
Wielkopolskie	-0.344	0.118	-1.554	0.138
Zachodniopomorskie	0.109	0.012	0.464	0.648

Explanations and abbreviations to Table 2:
the determined correlation coefficients are significant with $p < .05000$. N = 20 (missing data were removed by chance),
r (x,y) – Pearson's coefficient,
r² – coefficient of determination,
t – value of the "t" statistic examining the significance of the correlation coefficient,
p – the value of the test probability "p".

The correlation analysis of investment outlays incurred for nature protection and the surface of legally protected area per 1.000 inhabitants showed that in all voivodships, there are dependencies of varying strength and direction. The strongest negative significant relationship of very high strength between the investment outlays incurred for nature protection in investment outlays in the national economy, and the surface of legally protected area in the total area occurred in Pomorskie Voivodship (r = -0.714). Taking into account the coefficient of determination, it can be concluded that we are dealing with a good fit to the linear model, as evidenced by the R^2 coefficient at a level above 0.5. This

means that the dependence in this region of Poland explains more than 50% of the variability.

Mazowieckie voivodship ranked with a slightly lower result but with a high strength of association (r = -0.678). A negative correlation relationship indicates that an increase in the value of one variable is associated with a decrease in the value of the other variable. In addition to negative correlations, statistically significant positive results with high relationship strength were also observed in four voivodships: Łódzkie (r = 0.653), Lubelskie (r = 0.612), Opolskie (r = 0.569) and Śląskie (r = 0.550). A positive correlation means that as the share of one variable increases, the share of the other variable increases. On the other hand, the coefficient of determination in these voivodeships was below 0.5.

Statistically significant results with the strength of the relationship at the average level were achieved by five voivodships. Relationships with a positive direction were recorded in Podlaskie (r = 0.481) and Świętokrzyskie (r = 0.419), while a significant negative correlation was observed in Małopolskie (r = -0.489), Podkarpackie (r = -0.492) and Wielkopolskie (r = -0.344), i.e. as one variable increases, the other variable decreases.

In four voivodeships, statistically significant results with a weak relationship were obtained. A positive correlation was observed in the Zachodniopomorskie Voivodeship (r = 0.109), where an increase in the value of one variable causes an increase in the value of the other variable. On the other hand, the negative direction of weak correlations was observed in the following voivodships: Kujawsko-Pomorskie (r = -0.130), Lubuskie (r = -0.256) and Warmińsko-Mazurskie (r = -0.152), which indicates an increase in the value of one variable and decrease in the value of the second variable. In the Dolnośląskie Voivodeship, the correlations were not significant, as they indicate a slight relationship between the selected variables.

Discussion/Limitation and future research

Compared to other European countries, Poland is characterised by a relatively high percentage of protected areas, i.e. areas of favourable natural values. In 2021, the European Union and its Member States protected 1,115.4 thousand km^2 of terrestrial habitats, covering 26.4% of the land area of the European Union. Since 2013, this area has increased by nearly 317,000 km^2, which means an increase of 39.7%. At the same time, the protected area in Poland covered 123.5 thousand km^2, which accounted for 39.6% of our country's land area. Even larger protected area was shown by Slovenia 40.5%, and Bulgaria 41.0% and the largest area in relation to the area of the country, 51.5%, was shown by Luxembourg. The smallest share of protected area was then recorded in Finland – 13.2%, Ireland – 13.9%, Sweden – 14.1% and Belgium – 14.6%. If the current rate of increase in protected areas in the European Union is maintained, the bio-

diversity target set in the EU strategy at the level of protection of at least 30% of land and sea in Europe will be achieved in 2030 (Locja.pl, 2022).

The natural environment has played a key role in human life since the beginning of mankind's existence because it guarantees the satisfaction of existential, spiritual and social needs, offering security and development (Krajewski, 2018). People functioning in the environment cause pollution that leads to changes in ecosystems. Each of them has a specific capacity, i.e. the ability to bear anthropogenic loads, and the consequence of exceeding this capacity is irreversible environmental effects (Poskrobko & Kostecka, 2016). It is important to protect the environment related to the collection, disposal, reduction, prevention or complete elimination of pollution and losses resulting from human activity (Broniewicz & Poskrobko, 2003).

In the subject literature, there is an opinion about the importance of tourist activity in areas of natural value in mitigating the dysfunction of cities and urban agglomerations (Puciato, 2009; Krajewski & Świątkowska, 2008). The specificity of protected areas (also related to cultural and religious heritage) influences the different development potential and forms of tourism that can be implemented in individual regions (Malkowska et al., 2022; Mróz, 2017; Oleśniewicz et al., 2020). Areas that have been protected due to their landscape value are of great importance for those people who are seeking contact with nature.

Disturbing changes in the environment are intensified by increasing anthropogenic pressure. This is the result of socio-economic development and uncontrolled consumerism uncorrelated with ecological awareness. The implementation of nature protection objectives requires environmental investments, and these activities, regardless of where they are implemented, are accompanied by high investment expenditures. Environmental investments are related to all elements of the environment: water, air, soil, waste, noise, ionising radiation. Therefore, it becomes necessary to incur specific and sometimes high outlays related to environmental investments (Pawlewicz & Pawlewicz, 2012). Most of the funds are spent on water protection (Górska, 2013; Chojnacki, 2017; Gołębiewska & Ślusarz, 2014; Kozłowski, 2016).

Conclusions

The area of legally protected area in the analysed period does not show high volatility, which is confirmed by the low dynamics of changes. There are, however, differences depending on the region. At the same time, the dynamics of changes in investment outlays incurred for environmental protection in Poland is the opposite (this type of outlay in the last year of the analysis was 80% higher than in the base year). In this case, we also observe differences in the level of changes in dynamics in individual voivodships, recording the highest increase in the level of investment outlays in the Świętokrzyskie (210%) and Lubelskie (128%) voivodships.

At the next stage of the research, an answer was sought to the question of whether the surface of a high natural value area affects the investment outlays incurred for nature protection and whether there is a relationship between them. Linear correlation analysis was used for this purpose. The results obtained for the whole of Poland show a slight correlation, which proves that the relationship between the analysed variables is very small and that the correlation direction is positive. On the other hand, the analysis at the regional level showed differences in the relationship between the variables in individual voivodeships. A high positive relationship was observed in the Podkarpackie and Dolnośląskie voivodeships, while a high statistically significant negative relationship was observed in the Opolskie voivodeship. Negative relationships at the average level were reached in three voivodeships: Podlaskie, Świętokrzyskie and Zachodniopomorskie, while positive ones were in Podlaskie and Świętokrzyskie.

The next stage of the research made it possible to check whether the surface of a legally protected area per 1.000 inhabitants has an impact on the investment outlays incurred for nature protection. It turned out that the analysis carried out for the whole of Poland showed the existence of a negative correlation and an average strength of the relationship between the analysed variables, while in individual voivodships, there are dependencies with a different strength of the relationship and in a different direction. A strong negative relationship between the surface of legally protected area per 1.000 inhabitants and the investment outlays incurred for nature protection per 1.000 inhabitants occurred in the Pomorskie and Mazowieckie voivodeships. However, further analysis showed statistically significant positive correlation results and high-strength relationships in four voivodships (Łódzkie, Lubelskie, Opolskie and Śląskie) analysis. Relationships at the average level were achieved by five voivodeships, including two with a positive direction (Podlaskie and Świętokrzyskie) and three correlations with a negative direction (Małopolskie, Podkarpackie and Wielkopolskie). In 4 voivodships, statistically significant results were obtained with a weak relationship, including positive results in Zachodniopomorskie and negative in Kujawsko-Pomorskie, Lubuskie and Warmińsko-Mazurskie.

During the research, an attempt was also made to answer the question whether the scale of investment outlays incurred for nature protection is proportional to the share of area of high natural value at the regional level in Poland? The obtained results showed that despite the existence of statistically significant dependencies with different strengths of the relationship and direction of correlation, it can be assumed that the level of investment outlays incurred for nature protection is not proportional to the share of the legally protected area. The explanation for this situation may be the fact that high natural value does not require large investments in nature protection itself because the conditions prevailing there in themselves have a positive impact on this protection. It can also be assumed that they serve more to maintain these values, which is certainly cheaper than trying to improve the condition of the natural environment. Addi-

tionally, it should be mentioned that the funds for the implementation of tasks in the field of nature protection can be allocated on different criteria than just the size of the protected area.

However, a positive relationship between total investments and the share of protected areas may indicate that naturally valuable areas (despite environmental limitations) can attract additional investments. For example touristic investments and/or infrastructural like water supply networks, sewage systems and sewage treatment plants, as well as local waste management.

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The contribution of the authors

Conceptualization, I.K.-W., H.A. and T.S.; literature review, I.K.-W., H.A., T.S. and S.M.; methodology, I.K.-W.; formal analysis, I.K.-W., H.A. and T.S.; writing, I.K.-W., H.A., T.S. and S.M.; conclusions and discussion, I.K.-W., H.A., T.S. and S.M.

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NAKŁADY INWESTYCYJNE NA OCHRONĘ ŚRODOWISKA W KONTEKŚCIE UDZIAŁU OBSZARÓW O WYSOKICH WALORACH ŚRODOWISKA PRZYRODNICZEGO W REGIONACH POLSKI

STRESZCZENIE: Celem badania było ustalenie, czy istnieje związek pomiędzy wartością inwestycji realizowanych na rzecz ochrony środowiska a powierzchnią obszarów prawnie chronionych w Polsce. Problem badawczy dotyczy nakładów inwestycyjnych poniesionych na ochronę środowiska w odniesieniu do powierzchni obszarów o wysokich walorach przyrodniczych w Polsce z uwzględnieniem podziału na województwa w latach 2002-2021. Powierzchnia obszarów prawnie chronionych ogółem na terenie Polski nie wykazała dużej zmienności w analizowanym czasie, natomiast ocena zależności między zmiennymi wskazała na zróżnicowanie pomiędzy województwami. Wyniki analizy statystycznej wskazują, że istnieje pozytywna zależność pomiędzy nakładami inwestycyjnymi a udziałem obszarów prawnie chronionych oraz że poziom nakładów inwestycyjnych ponoszonych na ochronę środowiska nie jest proporcjonalny do udziału obszarów prawnie chronionych.

SŁOWA KLUCZOWE: nakłady inwestycyjne, ochrona środowiska, obszary cenne przyrodniczo, wartość przyrodnicza obszaru, obszary naturalne objęte ochroną prawną