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Investment risks in financing pro-ecological projects – the dilemmas

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Abstract

Environmental protection has increasingly adopted economic dimensions, and the environment is treated as a "capital" that can be used for economic and social development. This capital must be preserved for future generations, which is why increasing attention has been paid to taking pro-ecological actions to protect the environment. In order to improve the quality of the environment, it is necessary to make various types of investments in it. The Sustainable Development Initiative assumes that the economic growth of countries should be implemented in a manner consistent with the natural conditions of nature. The aim of this study was to identify and present the current possibilities of financing sustainability in Poland after joining the European Union, taking into account the risk of undertaking such an investment.

Introduction

Increasing attention has been devoted to environmental protection, and pro-ecological activities have begun to play a significant role in modern enterprises, which spend enormous resources on development and investments to ensure environmental protection. In the era in which economies are based on knowledge and other intangible factors, the topics addressed by this article are current and necessary. Economic growth and civilizational development inevitably lead to the destruction of the natural environment, which contributes to vast ecological losses and the emergence of a variety of problems that cannot be ignored. Countries worldwide have begun to focus on the state of the environment and have increasingly expressed the need to start actively working towards eliminating and limiting growing environmental threats. It has become obvious that international cooperation should be established to protect the natural environment because environmental issues have reached a global scale. Matters of sustainable development were discussed internationally for the first time in 1972 in Stockholm, as part of a UN conference. The sustainable development initiative assumes that the economic growth of countries should be implemented in a manner consistent with the natural conditions of the environment.

Excessive exploitation of the natural resources, along with excessive growth of consumer lifestyle, may lead to a situation in which future generations will lack proper conditions to function. Countries with a degree of development greater than that in Poland have begun to make changes related to environmental protection. Adaptation to the concept of sustainable development in Poland requires great effort and financial resources, as well as a proper awareness and appropriate environmental policy. Implementation of pro-ecological projects in the country mainly depends on the state authorities' interest in the issue, on the policy pursued, and on the involvement of all citizens. After joining the European Union, Poland gained enormous opportunities to raise funds to carry out tasks leading to sustainable development.

The aim of this study was to identify and present the current possibilities of financing sustainable development in post-EU-accession Poland. The study also aims to present data, analyze the statistical results showing the expenditures on pro-ecological investments, and provide future recommendations. The research methods used in this article include document analysis, logical and construct analysis, and case studies analysis.

The article concerns the development of environmental protection investments in Poland from 2014–2020. A SWOT analysis of the subject matter, as well as the investment risk associated with task financing, have been presented, and the paper ends with recommendations. The research methods primarily involved studying documents and analysis and logical construction. The sources that were used to write the article largely consisted of subject literature, national and foreign scientific publications, legal acts, and source materials on the implementation of environmental policies in the European Union.

Literature review

The environmental protection priorities in the European Union involve combating climate change, reducing pollution, protecting biodiversity, and better use of existing natural resources. The accession of Poland to the European Union in 2004 positively impacted residents' standard of living and the environment. EU membership stimulated the economy, which over the last several years has grown at a rate exceeding the average of the Organization for Economic Cooperation and Development (OECD). The difference in incomes, in relation to the OECD average, the poverty, as well as the income inequality, have decreased more than other OECD countries. The gross domestic product (GDP) per capita, however, is one of the six lowest in the OECD (OECD. Stat, 2019). Differences between a country's regions and within the regions themselves are also noticeable (OECD, 2015). Despite progress in distributing the pressure in matters of 'the environment vs. economic growth,' Poland has one of the most carbon-emissive economies due to its high dependence on coal. Although Poland has reduced its greenhouse gas emissions, its emission level still exceeds the requirements set by the Kyoto Protocol (Journal of Laws, 2002).

Since Poland's accession to the EU, its environmental law and environmental policy have been primarily indicated by EU environmental law. Responsibility for implementing environmental policies lies with lower-level authorities. The elected representatives of regional authorities are responsible for regulatory issues, such as the issuing of permits, and provincial inspectorates are in turn responsible for ensuring compliance with environmental regulations. The Regional Directorates under the Ministry of Environment are responsible for assessing environmental impact (Filipiak, Kochański & Szczypa, 2010, p. 55). Ecological goals, which are one aspect of sustainable development, play an important role in Poland's development policy. This has been emphasized in Article 5 of the Constitution of the Republic of Poland, according to which "the Republic of Poland shall safeguard the independence and integrity of its territory and ensure the freedoms and rights of persons and citizens, the security of the citizens, safeguard the national heritage and shall ensure the protection of the natural environment pursuant to the principles of sustainable development" (Journal of Laws, 1997).

While environmental objectives were generally not realized during the initial years of systemic transformation in Poland, after the accession to the EU, this situation area changed dramatically. The primary objective of the state's ecological policy is to ensure the ecological security of the country – its inhabitants as well as the social infrastructure and the natural resources. This assumes that the sustainable development strategy of Poland will allow the implementation of a model that will ensure effective regulation and control of environmental exploitation. The type and scale of exploitation should not threaten the quality and durability of natural resources (Szopik-Depczyńska et al., 2018). The overriding premise of sustainable development is to conduct such policies and activities in given sectors of the economy and social life, so as to preserve the resources and values of the environment in a state that will provide permanent, unprotected opportunities to use them by present and future generations. In addition, it also mandates maintaining the durability of natural processes and natural biodiversity, at the species, the gene, the landscape, and the ecosystem levels (United Nations, 2015). The essence of sustainable development entails equal treatment of social, economic, and ecological rationales, which requires integration of environmental issues with policy in various areas of the economy. When implementing the state's environmental policy, the principle of sustainable development is supplemented by a number of auxiliary and concretizing principles.

The current system of environmental protection financing in Poland constitutes a constant part of the country's financial system. It entails a set of rules and regulations that define the manner and mode of collecting and redistribution of the funds for pro-ecological undertakings. It was formed before the integration of Poland with the European Union and is somewhat based on various philosophies and sources of law. European Union regulations are characterized by a technological approach, imposing on environment users an obligation to strictly comply with product and emission standards. In turn, Polish law defines the activities related to environmental protection as those focused on environmental effects (Poskrobko & Poskrobko, 2012, p. 36). The funding for environmental protection includes expenditures for current protection, on activities of all environmental protection services, as well as on financing pro-ecological investments (Małachowski, 2011, p. 89).

The implementation of each investment project involves some risk. The risk in investment projects lies in the possibility that the actual investment outlays/outcomes will deviate from the ones originally planned; however, these deviations may have a positive or negative impact on the investing enterprise (Marcinek, 2001, p. 80).

The main factors that may impact investment projects are: economic, macroeconomic, and political (Rogowski & Lipski, 2018, p. 198). They may emerge as soon as the project starts. Economic factors are also referred to as project risks, because they are directly related to the implementation of the project. Macroeconomic factors are associated with risks that are related to general economic aspects such as inflation, exchange rates, or interest rates. Political factors are equated with a country's risk because it determines the effects of governmental policies of individual countries in connection with implementation of various types of projects.

The possible size of deviations reflects the size of the potential risk. Investment risks can emerge from both external and internal conditions. In order to correctly assess the risk, an analysis should be carried out, which may refer to a specific project, to the impact the project has on the company's business activity risk, as well as to the impact of the project's risk on shareholder decisions (Jajuga & Jajuga, 2008, p. 358). Investments in environmental protection are specific investments that are often not directly related to the main goals of the company's business operations; nevertheless, an analysis of the risk level should also be made.

The degree of risk depends on the type and class of the assets that constitute the object of investment. Before making an investment decision, in addition to the potential profit forecast, the risk factors that may be associated with the investment should also be specified. Investing in financial instruments involves the possibility of losing part or all of the originally invested funds. In the case of derivative instruments, there is a risk of incurring a loss that exceeds the investor's original contribution. Archival results from investments made, mainly those with a high rate of return, do not guarantee similar returns in the future. Investment risk is the risk of incurring a loss on the investment or the risk of realizing a lower return rate than the one expected by the investors.

The types of investment risk factors in financing investment tasks include (Rogowski & Michalczewski, 2005, p. 37):

- Interest rate risk;
- Exchange-rate risk;
- Liquidity;
- Credit risk;
- Political risk;
- Financial risk and business;
- Financial leverage risk.

The European Commission highlights the fact that the financing of environmental protection activities should become more of an investment process. Unfortunately, investing in environmentally-friendly projects is less attractive and less predictable, and therefore riskier for investors. Often, the technologies associated with environmental protection are not advanced enough to provide investors with quick profits.

Risk analysis in pro-ecological projects is not easy. Potential investors do not always have relevant information on the project, which can directly impact the accuracy of an analysis. The scale of risk, in the case of a specific project related to environmental protection, depends not only on the duration of the entire project, but also on the characteristics of this investment, the stage of work of the pre-investment phase, and the persons implementing the investment (Czarnek et al., 2010, p. 128).

From the 1990s to 2012, environmental planning was based on cyclically-adopted special documents referred to as the 'Environmental Policy of the State' (EPS) (the original title of the document issued by the Ministry of Environment in Poland is "Polityka Ekologiczna Państwa"; the English translation of the document title is used in this article). Every four years, the Council of Ministers, together with the Sejm, approved the new EPS while providing

the Ministry of Environment with political support, along with a mandate to oversee the implementation of the policy. Reports on the progress of the work were regularly submitted to the Sejm.

In 2009, the approach to development planning was changed. It currently focuses on three overarching development strategies, along with nine strategic policies. Environment has been included in one of the strategic policies – the 'Energy Security and the Environment – the 2020 Perspective' (ESE) (the original title of the document issued by the Ministry of Environment and the Ministry of Economy in Poland was "Bezpieczeństwo Energetyczne i Środowisko – perspektywa do 2020 r." The English translation of the document title is used in this article). The strategy is supervised by the Ministry of Economy, in cooperation with the Ministry of Environment. One of the biggest challenges for Poland is to balance economic growth with care for the environment. The goal of a sustainable development strategy is "to ensure a high quality of life for current and future generations, by taking into account environmental protection and creating conditions for sustainable development of a modern energy sector that can provide Poland with energy security and a competitive and efficient economy" (Monitor Polski, 2014).

For the mechanism to function effectively, it is necessary to implement effective processes that enable coordination, monitoring, and correction of environmental policy. The main ESE assumption, with regards to environmental protection, entails activities aimed at reducing air pollution, as well as reformation of water management systems, and rational exploitation of natural resources (GIOŚ, 2017). The most important objectives of the ESE strategy are presented in Figure 1.

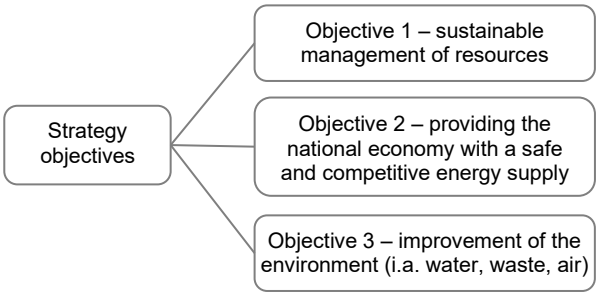

Figure 1. Objectives of the 'Energy Security and the Environment' Strategy (based on the data from (GIOŚ, 2017))

In 2018, a draft of 'Environmental Policy of the State 2030' (EPS 2030) was proposed, which was prepared in accordance with the provisions of the Act on the Principles of Conducting Development Policy (MŚ, 2018). Ultimately, the proposed ESP was meant to replace the existing 'Energy Security and the Environment – the 2020 Perspective' strategy. Implementation of the ESE, until 2018, indicates that not even half of the assumed indicators were achieved (6 out of 15 indicators were implemented).

Implementation of the objectives set by the ESE strategy (as well as of the planned EPS 2030) requires various types of investments – both at the national and the regional levels, or even at the level of individual entities. The financial resources to implement pro-ecological investments are divided into (Barczak & Kowalewska, 2014, p. 39):

- funds from the central budget and from the budgets of local government units;
- funds from foreign sources (mainly from the EU);
- private funds (personal funds, credits, loans, etc.).

This article mainly involves environmental investments financed using EU funds. One of the basic assistance programs supporting pro-ecological investments is the Operational Program Infrastructure and Environment (OPI&E) which defines the directions of support for activities in the fields covered by the EU's multiannual financial framework from 2014–2020 (previously for 2007–2013). According to the definitions set out in the Strategy, sustainable development means building a sustainable and competitive economy that efficiently uses resources. One of the main elements of the Strategy entails one of its main projects – a version of Europe that efficiently uses resources. The structure of the Program consists of four main thematic objectives:

- a low-emission economy,
- counteraction and adaptation to climate change,
- environmental protection,
- transport and energy security.

Program activities have been selected to contribute to the main goal of supporting the sustainable development of an economy that efficiently uses resources, is environmentally friendly, and promotes territorial and social cohesion. On the one hand, the Program should implement the assumptions defined by EU strategic documents, and on the other, by the goals set by Poland's strategic documents in the areas it covers.

The legal basis is a forecast of the impact the Operational Program Infrastructure and Environment 2014–2020 will have is the act of November 3, 2008 on sharing information about the environment and its protection, the public participation in environmental protection, and environmental impact assessments (in short, the Environmental Impact

Assessment Act) (Journal of Laws, 2008). This Act contains an adaptation to the Polish legislation, of the Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 concerning the assessment of the environmental impact of certain plans and programs.

The Strategy is based on the principle of an entire country's sustainable development, on the economic, social, environmental, and territorial dimensions. It recognizes that it is important to properly shape the relationship between economic competitiveness, care for the environment, and quality of life. The document sets the goal of preserving and developing the environmental potential for the future generations, through an innovative approach and appropriate management of resources. The measures to improve the environment can improve the quality of life and health of a society.

As part of the strategic assessment of the environmental impact, the Forecast of the environmental impact was prepared for the Operational Program Infrastructure and Environment 2014–2020 in accordance with applicable regulations and arrangements. It was developed to comprehensively analyse the possible impacts on individual elements of the environment that are provided in the Program, to assess the cumulative impact, to analyse the possibilities for using alternative solutions, and to provide compensatory measures. The Forecast is aimed at defining directions to support activities in the areas covered by the EU's multiannual financial framework from 2014–2020. On the one hand, the objectives that are defined by the EU strategic documents should be implemented; on the other, the objectives set by Poland's strategic documents, in areas related to the Program, should also be pursued. The main objective of the OPI&E is to support the implementation of the basic EU strategy 'Europe 2020', i.e. the Strategy for intelligent and sustainable development that is conducive to social inclusion, as well as supporting the implementation of the objectives set out by the Member States (EC, 2010). With the definitions contained in the Strategy, sustainable development consists of building a sustainable and competitive economy that efficiently uses resources.

The OPI&E, which resulted from the provisions referring to the strategic assessments and arrangements with the General Director for Environmental Protection, the Chief Sanitary Inspector and the relevant directors of maritime offices as well as from

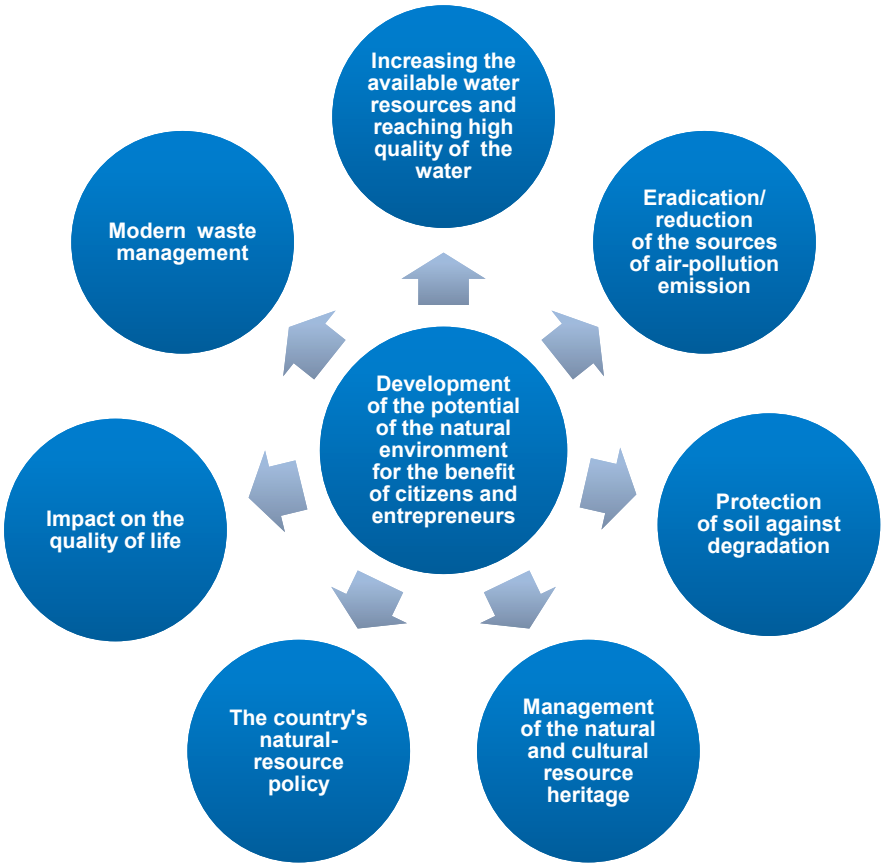

Figure 2. The intervention directions defined in the Strategy for Responsible Development (based on the data from (GIOŚ, 2017))

the guidelines set out by the Ministry of Regional Development, the guidelines regarding integration of the issues pertaining to the climate change and biological diversity into the strategic evaluations, as well as from own experience. After defining the scope of the environmental impact Forecast, it has been assumed that the initial elements to be evaluated will involve (EC, 2013):

- an analysis of the Operational Program project (OPI&E),
- an analysis of the actual state of the environment.

The first stage of the OPI&E project was analyzed, which covered the Program's fundamental structure, based on which conclusions were drawn from the general observations of the support areas regarding the actual activities that can be supported by the Program in order to clarify their possible environmental impacts. These activities were divided by the similarity of their environmental impacts, while the initial imaging, within the scope of the possible negative impacts, was made with regard to the type of project. Table 1 presents grouped projects.

Table 1. Priority projects from 2014–2020 (based on the data from (Atmoterm, 2013))

I Priority Axis	Reduction of the economy emissivity
II Priority Axis	Environmental protection, including adaptation to the climate change
III Priority Axis	Development of environmentally-friendly transportation infrastructure, which is important on the European scale
IV Priority Axis	Increase of accessibility to the European transportation network
V Priority Axis	Improvement of energy security
VI Priority Axis	Protection and development of cultural heritage
VII Priority Axis	Strengthening the strategic health-protection infrastructure
VIII Priority Axis	Technical support

The amount of funds allocated for environmental protection is presented in Table 2.

Table 2. II priority axis – Environmental protection (based on the data from (Atmoterm, 2013))

Eligibility period	January 1, 2014 – December 31, 2023
The name of the fund and the amount in €	FS, 3 508 174 166
The Managing Authority	The Ministry of Development

With regard to the Program, environmental changes can occur by such phenomena as: transformation of land, gradually increasing urbanization, new communication solutions, changes in climatic conditions, changes in wind conditions, changes in water conditions, natural disasters, industrial catastrophes, transportation accidents and disasters, or emergency situations. Table 3 summarizes the analysis of the environmental impact of individual actions, which are specific to the Program within particular axes. Additionally, the probability of environmental changes gaining strength in the relations between the axes was assessed. There is high probability of occurrence of a change in the environment for axes II, III, IV, and V; an average probability for axes I and VI; a small probability for axis VI. Combined impact may also occur, particularly when activities under axes II – III – IV – V unfold at the same place and time.

Table 3. Matrix of the impact that project objectives under individual have on environmental changes (L - large, M – medium, S – small) (based on the data from (Atmoterm, 2013))

	Axis I	Axis II	Axis III	Axis IV	Axis V	Axis VI	Axis VII
	1	2	3	4	5	6	7
Axis I		M	M	M	M	S	S
Axis II	M		L	L	L	M	S
Axis III	M	L		L	M	M	S
Axis IV	M	L	L		L	M	S
Axis V	M	L	L	L		S	S
Axis VI	M	M	M	M	S		S
Axis VII	S	S	S	S	S	S	

As part of the study, an analysis of the OPI&E was carried out, with regards to internal cohesion, compliance with the EU strategic documents, and compliance with Poland's strategic documents. The aim of the analysis was to determine to what extent an OPI&E project implements the objectives set out in these documents and whether it is consistent with those objectives. Additionally, a review of the implementation indicators of the abovementioned documents was carried out from the perspective of the indicators of OPI&E implementation. During the course of the study, the results of positive implementation of the Program were also analyzed, primarily from the perspective of environmental protection and sustainable development. These conclusions were necessary for further work on the Forecast.

Analyzing the current state of the environment was performed next, and a leading baseline document was used for this assessment. The analysis mainly covered the areas of possible support in the field of environmental protection, from the perspective of the demand, and the possible impact of the OPI&E implementation. The general approach, remodified

depending on the specificity of a given environmental element, entailed a comprehensive assessment of the state of the matter, the change trends listed, the actions undertaken at the national level, and the effects of that activity. It also analyzed compliance with the necessary regulations e.g., in the air quality, as well as conclusions on the most important issues. The next stage consisted of a detailed analysis of the impact that individual groups that will be supported by the Program have on selected environmental elements. The starting point for the analysis was to determine the assessment criteria. This was done by analyzing the state of the environment and the most important problems, the legal requirements, the conclusions from analyzing the strategic documents, and from an analysis related to the evaluation questions. A GIS application was used to compare precise support areas with the current state of environmental protection (e.g., by overlapping maps of projects in communication areas with maps of protected areas). Independently, the cumulative impact of the entire OPI&E on individual elements of the environment were also analyzed, and preventive measures limiting the negative impact were indicated. When analyzing the environmental impact, the conditions of the cumulative impact of the activities included in the OPI&E and other known projects planned for implementation, were taken into account. As a result of the aforementioned analyses, the purposefulness and possibilities of using alternative solutions were considered. The effects, in the case of an absence of the Program, were also assessed.

Based on the estimation of the possible impact of the OPI&E on the environment, the following conclusions were drawn (Atmoterm, 2013):

1. It is estimated that implementing the entire Program will have a positive impact on the environment and will help solve many problems concerning the improvement of the environment.
2. Assessing the environmental benefits due to implementing the Program indicates that it solved environmental problems and supported financing environmental activities implemented in the country.
3. Without implementing the Program, national measures to protect the environment would have to be significantly reduced due to insufficient national resources.
4. The analysis of internal coherence, carried out with regards to the main objective of supporting an economy that efficiently uses resources, is environmentally friendly, and conducive to territorial and social cohesion (i.e., clean and effective energy, adaptation to climate change, ad competitiveness) with the thematic objectives and to cohesion between the activities implemented under the axes concerned, demonstrated the Program's overall internal compatibility. A significant part of the investment priorities within the given axes complements and/or strengthens each another.
5. Based on an analysis of the objectives contained in the EU strategic documents, it has been found that the Program accomplishes the objectives contained in these documents. Slight differences and conclusions in this respect were included in the recommendations.
6. An analysis of the objectives contained in Poland's strategic documents showed that the Program accomplished these goals.
7. To limit the negative environmental impacts of the Program's, rules and recommendations have been proposed to monitor the effects of implementing the Program, as well as providing alternative solutions.

In addition, detailed recommendations have been formulated and proposed to be included in the documents detailing the scope of the Program or in the criteria used to select projects, i.e.:

1) As part of the Investment Priorities (IP) 6.5, it is proposed to promote integrated projects.
2) The content of IP 6.5 includes activities related to reducing pollution generated by industry, mainly by requiring an integrated environmental permit.
3) Many areas of support covered by the Program include the impact on air quality improvements, and lack a comprehensive approach to this problem and satisfactory support.
4) It is proposed to include support for such activities in the field of value analysis of ecosystem services and for activities involving the popularization of knowledge on this subject.
5) Educational activities should receive greater attention and comprehensive approaches in the Program. In the first place, the Program should include projects that cover civic education as effective forms of activities in the field of education and information.
6) In the Program, there is a lack of a need to rationalize the activities from the perspective of sustainable development with regards to the impact of reducing the consumption of fossil raw materials, waste reduction, and burning.
7) It is recommended to emphasize the advisability of using and promoting innovative solutions.
8) It is proposed to emphasize the advisability of energy support.

9) It is recommended that the managing, the intermediary, and the implementing institutions pay special attention to the correctness of EIA procedures.
10) Recovery of energy from waste should be limited to non-recyclable materials.
11) Support for the construction of municipal waste incineration plants should depend on developing a waste incineration concept, e.g., on a national scale.
12) Lack of activity to support a reduction in noise nuisances.
13) At the stage of project selection, it is recommended that all newly-developed projects supported in the Program are included in the strategic assessments prepared for these documents.

Conclusions

Structural funds constitute an important part of present-day enterprises. The current system of financing environmental protection in Poland provides funds for the implementation of many pro-ecological investments that have led to a serious improvement in the environment. Recently, innovative legal requirements, supported by a huge financial approval of the European Union, have turned out to be an unprecedented stimulus for changes and have increased environmental awareness in Poland. Currently, financing environmental protection investments in Poland is a growing area of activity for many institutions. Organizational units, institutions, and all entities implementing sustainable development and environmental education tasks in Poland can use financial assistance from structural funds, earmarked funds, foundations, and banks.

The Programs implemented using the European Regional Development Fund include the Operational Program Infrastructure and Environment, and the 2007–2013 budget amounted to EUR 28.3 billion. Both in the previous and the current perspectives, the largest investments carried out with the OPI&E funds included the construction of sewage systems and sewage treatment plants, the modernization of landfill sites, the development of waste utilization and recycling plants, and the modernization of heating and power plants. These investments are all very expensive, which is why support from the EU funds is so important. In turn, from 2014–2020, the environmental-protection budget planned from the OPI&E Program was EUR 27.5 billion (IBnGR, 2016).

Managing investment risk, in particular correctly identifying and properly measuring, is a multi-stage process. In order to guarantee correct risk identification, a reliable and thorough data analysis and the proper selection and interpretation of selected indicators is necessary. Proper measurement of investment risk and the EU financing of investments enables conscious selection of the proper strategy for credit portfolio management and the application of appropriate methods and tools to reduce risk. Investors must operate under strictly-defined economic, social, political, and legal conditions. In the contemporary market, which is characterized by high volatility, intensifying competition, and pressure from time and the globalization of processes and structures, investments and financing are always accompanied by risks of variable natures and scales, which can cause failure or loss. Investment companies bear inherent investment risks associated with running a business. There are, however, many other types of risks that are characteristic of business operations, including those implementing pro-ecological investments, such as credit risk, market risk, operational risk, liquidity risk, and legal and regulatory risks.

The hypotheses were confirmed, but there is still a need to deepen the research on the risk of pro-ecological projects. Ecological projects are often time-consuming and ultimately provide a smaller return for the investor than commercial investments.

References

1. Atmoterm (2013) *Prognoza oddziaływania na środowisko projektu Programu Operacyjnego Infrastruktura i Środowisko 2014–2020*. Available from: https://www.pois.gov.pl/media/1172/Prognoza_oos_POIiS_2014_2020_29012015.pdf [Accessed: April 07, 2019].
2. Barczak, A. & Kowalewska, E. (2014) Financing Sources of Tasks in the Field of Environmental Protection in Poland – an Overview of Applied Solutions. *Prawo Budżetowe Państwa i Samorządu* 1 (2), pp. 37–58 (in Polish).
3. Czarnek, J., Jaworek, M., Marcinek, K. & Szóstek, A. (2010) *Efektywność projektów inwestycyjnych*. Toruń: Towarzystwo Naukowe Organizacji i Kierownictwa.
4. EC (2010) *Communication from the Commission. Europe 2020. A Strategy for smart, sustainable and inclusive growth*. Brussels: European Commission.
5. EC (2013) *Guidance on integration Climate Change and Biodiversity into Strategic Environmental Assessment*. Brussels: European Commission.
6. Filipiak, B., Kochański, K. & Szczypa, P. (2010) *Budżetowanie w ochronie środowiska*. Warszawa: CeDeWu.
7. GIOŚ (2017) *Stan środowiska w Polsce. Sygnały 2016*. Warszawa.
8. IBnGR (2016) *Raport. Finansowanie inwestycji środowiskowych*. Available from: http://www.ibngr.pl/content/download/1987/19201/file/RAPORT_Finansowanie_inwestycji_środowiskowych.pdf [Accessed: April 28, 2019].

9. Jajuga, K. & Jajuga, T. (2008) *Inwestycje. Instrumenty finansowe. Aktywa niefinansowe. Ryzyko finansowe. Inżynieria finansowa*. Warszawa: PWN.
10. Journal of Laws (1997) The Constitution of the Republic of Poland. Konstytucja Rzeczpospolitej Polskiej z dnia 2 kwietnia 1997, Dz.U. 1997, nr 78, poz. 483 z późn.zm.
11. Journal of Laws (2002) Ustawa z dnia 26 lipca 2002 roku o ratyfikacji Protokołu z Kioto do Ramowej konwencji Narodów Zjednoczonych w sprawie zmian klimatu (Dz.U. 2002, Nr 144, poz. 1207).
12. Journal of Laws (2008) Ustawa z dnia 3.10.2008 r. o udostępnianiu informacji o środowisku oraz jego ochronie, udziale społeczeństwa w ochronie środowiska a także o ocenach oddziaływania na środowisko (Dz.U. 2008, Nr 199, poz. 1227 z późn.zm.)
13. Małachowski, K. (2011) *Gospodarka a środowisko i ekologia*. Warszawa: CeDeWu.
14. Marcinek, K. (2001) *Ryzyko projektów inwestycyjnych*. Katowice: Wydawnictwo Akademii Ekonomicznej.
15. Monitor Polski (2014) *Uchwała nr 58 Rady Ministrów z dnia 15 kwietnia 2014 r. w sprawie przyjęcia Strategii „Bezpieczeństwo Energetyczne i Środowisko – perspektywa do 2020 r.”*. Monitor Polski Poz. 469 tom 1.
16. MŚ (2018) *Polityka Ekologiczna Państwa 2030. Projekt.* Available from: https://bip.mos.gov.pl/fileadmin/user_upload/bip/prawo/projekty/PROJEKT_POLITYKI_EKOLOGICZNEJ_PANSTWA_2030/Projekt_Polityki_ekologicznej_panstwa_2030.pdf [Accessed: April 20, 2019].
17. OECD (2015) *OECD Przeglądy ekologiczne OECD – Polska 2015 – Ocena i rekomendacje*. Available from: https://www.gov.pl/web/srodowisko/przeglady-srodowiskowe-polski-na-forum-oecd [Accessed: April 06, 2019].
18. OECD.Stat (2019) *Level of GDP per capita and productivity* [Online] Available from: https://stats.oecd.org/ [Accessed: April 27, 2019].
19. Poskrobko, B. & Poskrobko, T. (2012) *Zarządzanie środowiskiem w Polsce*. Warszawa: PWE.
20. Rogowski, W. & Lipski, M. (2018) Czynniki ryzyka w projektach inwestycyjnych realizowanych w formułach *corporate* i *project finance*. Studia i Prace Kolegium Zarządzania i Finansów, Zeszyt Naukowy 159, pp. 195–212.
21. Rogowski, W. & Michalczewski, A. (2005) *Zarządzanie ryzykiem w przedsięwzięciach inwestycyjnych. Ryzyko walutowe i ryzyko stopy procentowej*. Wolters Kluwer.
22. Szopik-Depczyńska, K., Kędzierska-Szczepaniak, A., Cheba, K., Szczepaniak, K., Gajda, D. & Ioppolo, G. (2018) Innovation in suitable development: an investigation of the EU context using 2030 agenda indicators. *Land Use Policy* 79, pp. 251–262.
23. United Nations (2015) *Transforming our world: The 2030 Agenda for Global Action*. [Online] September 01. Available from: https://www.un.org/development/desa/disabilities/news/news/disability-and-the-sustainable-development-goals.html [Accessed: January 12, 2019].