

ANALYSIS OF ECOLOGICAL ACTIVITY OF PODLASIE PROVINCE

Agnieszka Kisło¹, Iwona Skoczko¹

¹ Department of Technology in Engineering and Environmental Protection, Faculty of Civil and Environmental Engineering, University of Technology in Białystok, 45A Wiejska Str., 15-351 Białystok, Poland, e-mail: agnieszka.kislo@wp.pl

Received: 2013.11.28
Accepted: 2013.12.18
Published: 2014.01.15

ABSTRACT

The beginning of the period where the impact of human activity took dangerous size is considered to be 40 years of the nineteenth century. Then the large-scale production of electricity increased production of metallurgical industry and transport development. Significant changes contributed to rapid population growth and urbanization and industrialization processes. Man by intensive exploitation reduces or completely exhausted most natural resources. This has resulted in the availability criterion, which is distinguished by inexhaustible and exhaustible resources. Exhaustible resources may include solar, wind, energy, ocean currents and the energy of the Earth. Exhaustible resources, however, are the elements of nature that as a result of the operation can be completely depleted or destroyed. These resources include: water, soil, plant world, animal world natural resources. The greater the intensity of acquiring human resources, the faster will be the depleted. There is also a very important division of exhaustible resources: non-renewable resources, renewable and very difficult reproducible (living areas). Non-renewable resources are mainly minerals, such as iron ore, crude oil, coal, sulfur, natural gas, useful stones, limestone, salt, and many other minerals). After extraction resources are processed, and the bed from which they were extracted can no longer be used. It is different from renewable resources; they are characterized by the fact that over time they are reconstituted, although, for this to happen balance of the environment through the rational use must be maintained. These resources include, among others, soil, water, flora and fauna, as well as atmospheric air.

Keywords: natural resources, environmental transformation, environmental management, sustainable development.

INTRODUCTION

Anthropopression, that the pressure exerted by humans on natural environment often causes irreparable changes. The basic factors of anthropogenic impact include: waste—that is worn objects and substances(non-sewage) waste—that is, a mixture of waste water and chemical pollution, biological and thermal burden on the environment, pollution of the environment—that is, foreign ingredients in any part of the environment that cause distortion of the characteristics; environmental disturbances—that is, noise, vibration, radiation, malodorous fumes, harmful or nuisance to the environment [4].

Environmental protection is a rational, consistent with the laws of nature and of social shap-

ing of human environment, so that the elements of nature united harmoniously with the products of technology and civilization. The origins of interest in environmental issues is a breakthrough year 60/70 in the twentieth century. Protecting the environment involves activities to enable the restoration of the natural balance. They consist of preventing or counteracting the negative effects on the environment, causing its destruction, damage, pollution, changes in physical, chemical or biological.

Activities under the protection of the environment:

- the use of clean or waste-less technologies,
- the use of technologies that reduce demand for raw materials,
- reducing energy demand,

- reducing greenhouse gas emissions,
- increasing recycling of materials and supplies,
- exploration and implementation of new technologies to reduce emissions,
- developing awareness [2].

Environmental awareness and actions that are taken in the context of its formation are Very important in protecting the environment. The aim of shaping ecological awareness is to sensitize human environmental problems and to develop such aspirations and lifestyles that will enhance the care of the surrounding nature. An important ascertainment extensive surveys of action on the environment is the finding that a prerequisite is to transform the environmental awareness of the Earth's population conditioning attitudes toward ecosystem. As noted by Szymańska [5] "consistent increase of investment for environmental protection is also an important task, as the wake of environmental awareness and education of the next generation in safety and preparation for life in harmony with sustainable development" [7].

Podlasie region belongs to the Polish regions of the purest state of the environment, as evidenced by lower than in other parts of the country the emission of air pollutants, the quantity and quality of discharged wastewater, heavy metals in the soil, the purity of surface and groundwater and other environmental stress factors [4].

Almost entire region of Podlasie is located in the basin of the Vistula River. Only the north-eastern part is in the basin of the Neman River. The main hydrographic form Narew, Biebrza and the Bug, a complement to the network are the lake. The largest of these is Wigry, Hańcza, Szurpiły, Necko, Rajgrodzkie. Podlasie region boasts a beautiful, unspoiled nature and diversity of the landscape. It belongs to the Polish Green Lungs. There are beautiful forests, which have been preserved almost intact: fragments of Knyszyńska Forest, which is one of the largest forests in Poland. Outside the county there are also Narew National Park - with a highly complex system of river channels, which is often called the "Polish Amazon", is a refuge for many animals, especially waterfowl and wildlife reserves [4].

The second distinguishing feature is its multiculturalism - Podlasie and rich history of shaping the influences of various multi-denominational nations. The dominant sector of its economy of the region is agriculture, which is almost entirely associated with the private sector. The level of in-

dustrialization in Podlaskie Province is low and based mainly on the production and processing of food, which is dominated by dairy products, meat, fruit and vegetables, brewing, distilling and milling [7].

METHODOLOGY

In order to meet environmental assessment activity two methods were used. First, examination of documents, consisted of the collection, selection and interpretation of documents, making an assessment of the effectiveness of the tasks contained in the strategic management of the environment for the protection of the environment, as well as familiarize themselves with the state of the environment, the organizational structure, and resolutions of local government.. The second method was a method of self-observation (the environment), which is based on the observation of phenomena and drawing conclusions. Strategic documents, in environmental management for the protection of the environment are:

- Environment Programme,
- Strategy Development,
- Waste Management Plan,
- Study of Conditions and Directions of Spatial Development.

DISCUSSION

The first document, which is Environment Programme is aimed at achieving the objectives of the national strategic documents with a particular focus on the National Environmental Policy in Podlaskie. Its essence is coordinated, planned in the Programme activities with government, local government (district offices, offices of cities and municipalities) as well as business and society and their implementation by those entities with effective use of available funds. The program further defines a framework for subsequent projects implemented within the framework of province sectoral programs, and also includes guidelines for environmental programs at the county level. [6].

Development Programme carried out in accordance with current in the range of legislation, as well as on the basis of guidelines to develop environmental programs at the regional and local level prepared by the Ministry of the Environment (Warsaw, December 2002).



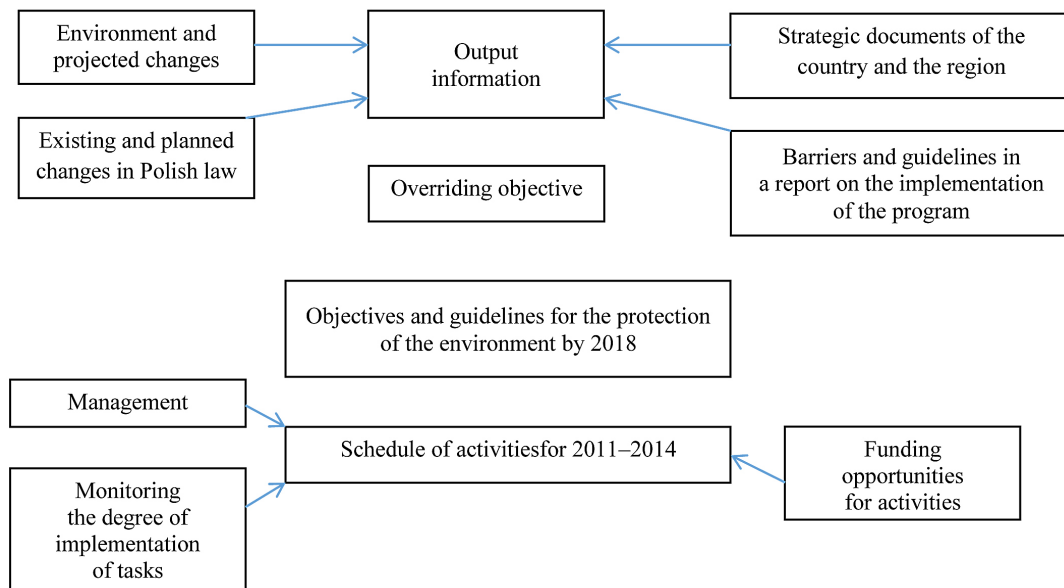


Figure 1. The process of creating Environment Programme [8]

Table 1. Actions taken under the Environment Programme in 2007-2010 [6, 9, 10]

Priority	Purpose	Activities
Priority I: Development of environmental infrastructure	Short-term: reduce traffic noise	<ul style="list-style-type: none"> development of road infrastructure in order to reduce noise and vibration, construction of bypasses,
	Short-term: reduce emissions of particulate matter into the air	<ul style="list-style-type: none"> keeping air quality standards concerning dust, the use of environmentally friendly technologies, boiler modernization and investment in the field of renewable energy sources (excluding those which increase the emission of dust in the zones to excessive dust standard),
	Short-term: limit eutrophication (agriculture, cleaning of sewage, wastewater village)	<ul style="list-style-type: none"> development of water and sanitation services in the province, modernization of out dated sewage treatment plants, restore the proper functioning of the drainage of areas at risk of water deficit,
Priority II: Protecting ecological region		<ul style="list-style-type: none"> protection of human health and life, active protection of nature and landscape, care for protected species increasing the number of forest areas in order to protect the atmosphere, compliance with the requirements of the regional information system and transport routes storage of hazardous materials, compliance with the requirements of the regional early warning system and support the emergency services, the strengthening of controls to protect against noise in the manufacturing and service facilities, offsetting losses of Nature 2000 sites, reducing the risk of major accidents and the efficient removal of their consequences, the development and implementation of air protection programs.
Priority III: Building environmental awareness		<ul style="list-style-type: none"> increasing the environmental awareness of the region's population, promoting co-style production and consumption, ecological education of children and youth in schools and kindergartens, the Environmental Protection Podlaskie Voivodeship for the years 2011-2014, the creation of local centers of environmental education, shaping information policy aimed at abandonment of conventional energy sources, mobilizing society to take environmental actions, supporting institutions and non-governmental organizations dealing with the protection of the environment, raising the effectiveness of compliance with environmental regulations.

Table 2. The term problems, 2011-2014 [6, 9, 10]

Area environmental	Problem priority problem	Purpose
Air pollution(PA)	Priority I: <ul style="list-style-type: none"> exceeding the permissible levels of PM10 and levels of objectives for long-term ozone 	Long-term objective for the year 2018 Continuation of measures to improve air quality Short-term objectives by 2014: 1. Introduction and implementation guidelines for the protection of Air Programs 2. The fulfillment of legal requirements for air quality by reducing emissions from sources of surface, line and point
Water(W)	Priority II: <ul style="list-style-type: none"> insufficient degree of channeling, not enough good water status Priority II: <ul style="list-style-type: none"> droughts 	Long-term objective by 2018 Achieving and maintaining good surface water status and protection of water quality underground and rationalize their use Short-term objective for 2014: 1. Providing good quality drinking water 2. The rationalization of the management of water resources 3. Improving the quality of surface and groundwater 4. Increasing retention basins and preventing the effects of drought and flood flow 5. Restoration and rehabilitation of the ecological continuity of rivers
Protection against noise (H)	Priority I: <ul style="list-style-type: none"> insufficient environmental monitoring (recognition of areas within zones of exceedance), oversized noise 	Long-term objective by 2018 Reducing noise pollution by reducing its intensity to the level of the existing standards Short-term objective for 2014: 1. Identification and assessment of the exposure of the inhabitants of the region to excessive noise, 2. Eliminating exposure to noise residents.
Renewable energy sources (RES)	Priority II: <ul style="list-style-type: none"> greater use of renewable energy sources 	Long-term objective by 2018 Reducing energy consumption and increase the use of renewable energy sources Short-term objective by 2014: 1. Increasing the use of non-conventional energy sources.
Soils and their impurities (GI)	Priority III: <ul style="list-style-type: none"> contamination of soils and land with heavy metal sand other substances of anthropogenic origin (wet and dry deposition), over-acidification of soils. 	Long-term objective by 2018 Protecting the earth's surface Short-term objective for 2014: 1. Development of the surface of the earth in accordance with the principles of sustainable development, 2. Indication of contaminated sites and remediation.

The program covers years 2011–2014 with the prospect of 2018. The Period obliges this Programme to be divided into:

- operating period (2011–2014), together with specific short-term objectives and the objectives of their implementation,
- perspective period (years 2015–2018), expressed by one long-term goal for each of the priorities of environmental protection.

The current state of the environment is described in the Programme on the basis of the available data mainly from 2009 in certain cases where it was possible was used more recent data (from 2010) [9].

The guiding principle adopted in the program is the principle of sustainable development, which enables harmonized economic and social development compatible with the protection of environmental values. Therefore, as the overarching goal of the program was adopted: “Sustainable

Development in the Region Podlaskie Improvements and Promotion of the Environment”.

This objective is in line with the vision of development of the region of Podlasie defined in the Strategy for the Development of the Podlaskie province by 2020 the region’s economic development must go hand in hand with measures to improve where necessary environment and behavior undoubtedly its exceptional natural values [6].

Another document analyzed is the Podlasie Region Development Strategy. Strategy is the key document defining the principles of software and directions of the long-term concept of development of the region.

The objectives set will be achieved and visible indicators will be achieved when assigned to them. This implies the monitoring of a limited number of indicators strategies for each of the objectives. When select in indicators guided the adequacy, however, the primary constraint



Table 3. Possible sources of funding included in the program, broken down into individual components of the environment [6, 7, 9, 10]

Source of funding	Components of the environment								
	renewable energy sources	water	waste management	nature and landscape protection	protection against noise	protection against electromagnetic fields	prevention of major industrial accidents	soils and their impurities	environmental education
NFOŚiGW	•	•	•	•	•	•	•	•	•
WFOŚiGW	•	•	•	•	•	•	•	•	•
POZE	•	•	•	•	•	•	•	•	•
Operational Programme Infrastructure and Environment	•	•	•	•	•	•	•	•	•
RPO WP	•	•	•	•	•	•	•	•	•
LIFE+	•	•	•	•	•	•	•	•	•
Priority Environmental Education Program	•	•	•	•	•	•	•	•	•
PPOPiK	•	•	•	•	•	•	•	•	•
PPOiZRL	•	•	•	•	•	•	•	•	•
ZRRPB	•	•	•	•	•	•	•	•	•
Program KPOŚK, BPiOOH	•	•	•	•	•	•	•	•	•
PZŚzLiS	•	•	•	•	•	•	•	•	•
PBGKoGZZKiWP	•	•	•	•	•	•	•	•	•
Preferential Loans and borrowings	•	•	•	•	•	•	•	•	•
Loans and advances granted by commercial banks	•	•	•	•	•	•	•	•	•
Intelligent Energy Europe Program	•	•	•	•	•	•	•	•	•
Project GDOŚ	•	•	•	•	•	•	•	•	•
POliŚ	•	•	•	•	•	•	•	•	•

Explanations:

NFOŚiGW – National Fund for Environmental Protection and Water Management.

WFOŚiGW – Regional Fund for Environmental Protection and Water Management.

POZE – program for projects in the field of renewable energy sources and cogeneration.

RPO WP – Regional Operational Programme of Podlasie.

Project GDOŚ – Design of the General Directorate of Environmental Protection.

EFFR – European Regional Development Fund.

WIOŚ – Inspectorate of Environmental Protection in Białystok.

POiIŚ – Operational Programme Infrastructure and Environment.

PPOPiK – The Priority Protection of Nature and Landscape.

PPOiZRL – The Priority Protection and Sustainable Development of Forests.

ZRRPB – The Priority Protection of areas of high natural - area Forest Sustainability Białowieża.

BPiOOH – Priority Programme “Construction, reconstruction and restoration of hydro-technical facilities”.

PZŚzLiS – The Priority Countering threats to the environment with the liquidation of their consequences.

PBGKoGZZKiWP – Understanding the geological structure of the country and the economy of resources and mineral reserves of groundwater.

was the availability of data. Due to the necessity preserving values of the major source of comparative data to monitor Strategy will be public statistics.

The potential financial resources that can be used by the public sector for the implementa-

tion of the Regional Development Strategy for the years 2013–2025 Podlaskie estimated a total of 59.8 billion PLN, which gives about 4.60 billion PLN average [7]. Possible sources of funding of the Development Strategy are presented in Figure 3.



Table 4. Indicators for monitoring purposes [6]

Strategic objective	Indicators objectives	Measure	Source	Base value (year)	Target (2020)
Objective 1: competitive economy	GDP per capita (constant prices of 2005)	PLN	calculations based on data from the Central Statistical Office	22 300 (2010)	30 687
	number of economic entities in the registry REGON per 10 000 inhabitants	pieces	Central Statistical Office	764 (2011)	830
Objective 2: national and international links	the value of exports per capita	EUR	calculations based on data from the Ministry of Finance	930 (2010)	1320
	share of foreign capital invested in the Podlaskie in the total value of the capital in Poland	%	calculations based on data from the Local Data Bank	0.27 (2011)	0.34
Objective 3: quality of life	balances internal and international migration for permanent residence	people per 1000	Central Statistical Office	-1.64 (2011)	-0.4
	the average monthly disposable income for one person in the household	PLN	Central Statistical Office	1188.5 (2011)	1648

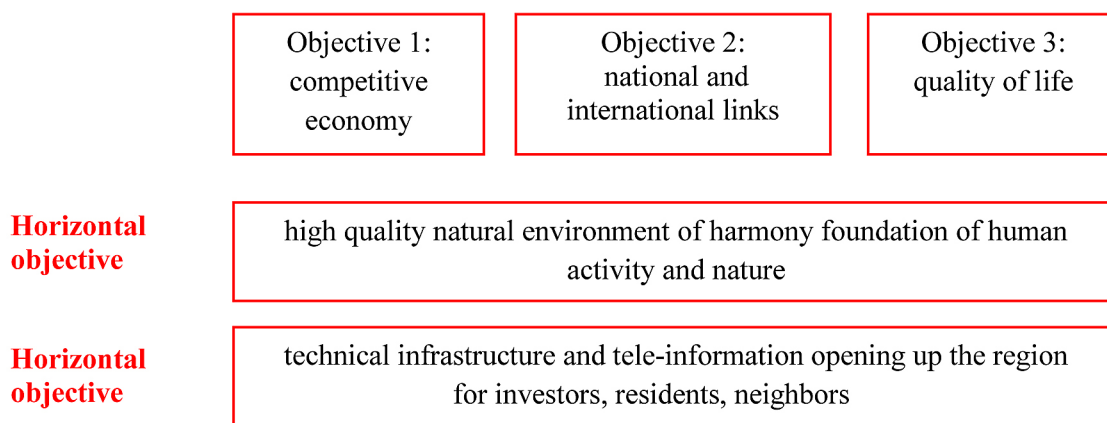


Figure 2. The objectives set out by [7]

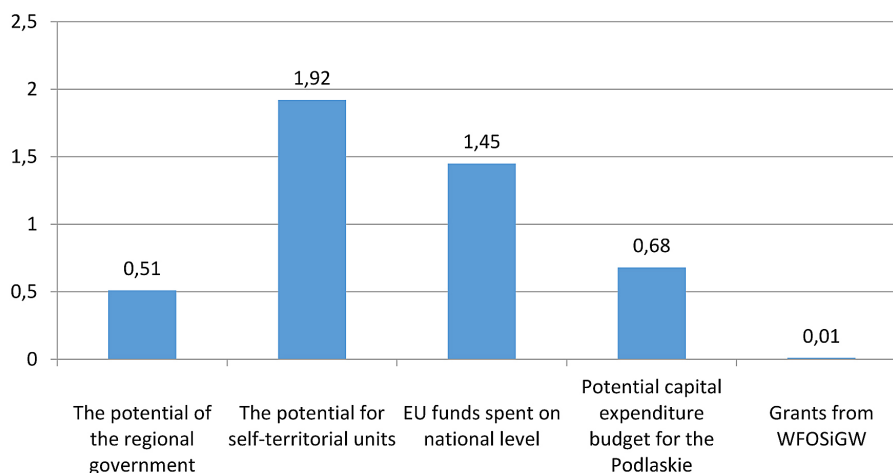


Figure 3. Possible sources of funding Development Strategy province Podlaskie [7]



Waste Management Plan is another document which was analyzed in order to assess ecological activity in Podlaskie. Waste Management Plan of the Podlaskie Voivodeship (hereinafter referred to as WPGO) in accordance with the provisions of the Waste Act (Article 15) including all types of waste generated in the province, and imported into its territory, in particular with regard to municipal waste biodegradable waste, packaging waste, waste the construction, repair and demolition of buildings and road infrastructure, worn out tires and hazardous waste, including used vehicles, electrical and electronic equipment waste, PCBs, asbestos, medical and veterinary waste, waste oil, batteries and accumulators [5].

As part of the project WPGO a series of meetings with the municipalities, which present guidelines for the creation of provincial waste management plan. The proposed variant division of the province of Podlasie region management were assessed municipalities that indicated to the region management Waste municipality will belong. Suggestions municipalities were used to develop a system waste management in this Project WPGO. The Plan aims and objectives relate to the period 2012–2017 [5].

The municipal waste management indicated to achieve the following objectives for 2017:

1. The increase in the share of recovery, in particular with regard to the recycling of glass, metals, plastics, paper and cardboard, as well as energy recovery from waste in accordance with the requirements of environmental protection.
2. Increasing the amount of separately collected hazardous waste occurring in the municipal waste stream.
3. Eliminate the practice of illegal dumping of waste [9].

For the realization of achieving the objectives it is necessary to engage in the following activities:

1. Measures aimed at the prevention of waste, reduce the amount of waste and its negative impact on the environment.
2. Support activities to the proper handling of waste in the collection, transport, recovery and disposal.
3. The implementation of the specified waste management system based on regions waste management (RGO) [9].

It is estimated that the total costs of the tasks in the field of waste management in Podlaskie region by 2017 will amount to 1 912 892 thousand PLN. The costs of the tasks are presented in Figure 4.

CONCLUSIONS

The province of Podlasie includes smaller local authorities with different economic potential and diverse natural conditions and degree of urbanization.

Most units are used to create strategic documents on environmental management. They are additional elements supporting the rational planning of activities and the prevention of risks. They planning activities in the environment, as well as anticipate, prevent or remove the effects of negative changes.

With these documents it is easier to implement the concept of sustainable development. It perfectly reflects the substance of the first sentence of the report of the World Commission on Environment and Development of 1987 – “Our Common Future”, i.e.: “At the present level of

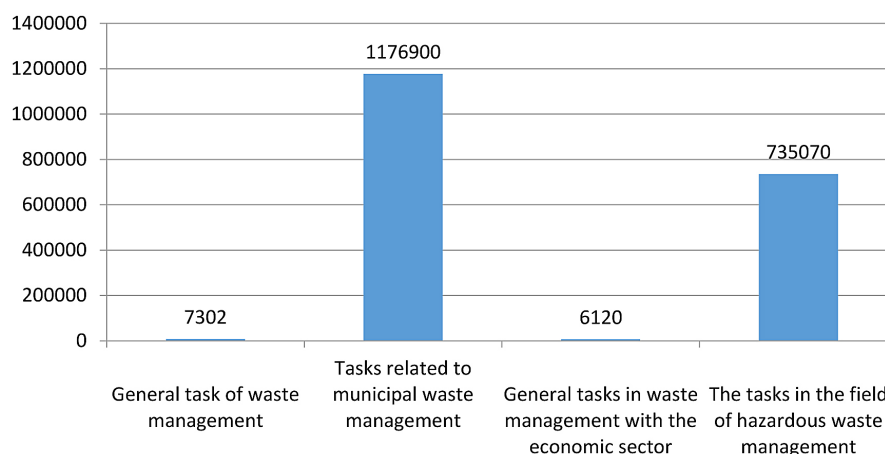


Figure 4. Estimated costs of implementation of the tasks under the Waste Management Program [9]

civilization sustainable development is possible, it is a development that meets the needs of the present generation may be met without compromising the ability of future generations to meet their own needs. It follows all the measures, which aim at striving for the development of social, political or economic aspects and should not indelibly impoverish natural resources. The development of particular areas should be limited by the capacity of the environment to human activities.

After analyzing those documents it was concluded that individual province regions differ in the level of sustainable development. This is primarily the result of unsystematic development documents, which can make chaos.

Undoubtedly, the document in which their goals were realized in the greatest number is the Environmental Protection Plan. The data presented in the Report show that within almost all components the planned actions have been taken. Short-term objectives were partially met. Long-term objectives were only partially achieved, and therefore, in many cases, the report suggests their continuation. The present state of the environment in Podlaskie is satisfactory, although it is necessary to continue environmental policy in the region, in order to preserve natural values in the region and maintain good environmental status.

Additionally, waste management plan was implemented effectively. The main objective was to reduce the number of waste segregation "at source", and the selection of recycled waste, broken down by means of recovery and disposal of waste generated in the municipal sector. strategies and tools to promote selective waste collection have an important role in achieving this goal. Through self-observation of the environment can be said to developed and undoubtedly improved its environmental activity without affecting significantly the landscape values for the last years. This is due to the fact that the development of the Podlasie province was allocated EUR 2 863 656 282.58 within the framework of the Regional Operational Programme 2007–2013 Podlaskie. This yielded 1,160 completed projects. Nearly half of these projects is to campaign for the wider environment. They concerned the development of environmental infrastructure, i.e., sewage treatment plants, landfills, water treatment stations, etc.

The field that begins to develop in the Podlaskie is renewable energy. Although this is a relatively new area, it has already gained many followers. Incentives to take advantage of renewable energy sources are solar subsidies, which can be as high as 70%. Cost of investment returns after about two years. Relatively few sources of energy use hydropower, biomass and wind energy in the Suwalki region. The impact of renewable energy on the quality of the natural environment is relatively small.

The investments resulted in the improvement of the sanitary condition of surface water due to the construction of new and modernization of existing plant. Expansion of the sewage network also contributed to the improvement of their quality. Requiring treatment was 39.3 hm³ (97.8%), and purified 39.0 hm³ (97%), including: mechanically – 0.8 hm³ (2%), biologically 13.7 hm³ (34,1%) and biological nutrient removal with increased 24.5 hm³ (60.9%). From a sanitary sewage system uses 60.2% of the inhabitants of the region [4].

In summary, for the evaluation of ecological conditions in the province of Podlasie two methods were used. The first of these was the analysis of strategic documents on environmental management. On the basis of this method, it was concluded that local authorities in Podlaskie are at different levels of sustainable development. Shortcomings and deficiencies observed in the presence of strategic documents. Analyzing documents for the region as a whole unit it can be concluded that the documents that help in environmental management, are implemented fairly, define specific objectives, which are successively implemented. Phenomena and processes occurring in the proximal and distal environment province, the context of the new EU financial perspective, as well as internal conditions and the structure of the objectives make it necessary in the coming years to involve many institutions and teams of human and financial resources in key areas of structural intervention.

The second method used to assess the activity of the ecological province of Podlasie was a method of self-observation. On the basis of this method it was estimated that environmental activity of the region is at a high level. This fact stems mainly from the fact that local authorities utilize resources for the wider environment very well, causing the improvement of the environment over recent years.



REFERENCES

1. Berkowska E. 2004. Transpozition european law to the Polish environmental law. Biuro Studiów i Ekspertyz, Wydział Analiz Ekonomicznych i Społecznych, no. 1023/2004.
2. Nowak-Far A. 2000. Environmental Protection in UE. Warszawa, 4(15).
3. Pyłka-Gałkowska E. 2004. Ecology and environmental protection. Wydawnictwo Oświata, Warszawa.
4. Szczepanowski A.E. Qualities and tourist attractions the region of Podlasie.
5. Szymańska U., Zębek E. 2008. Law and environmental protection – legal, economic, ecological and technical aspects of natural environmet protection. Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego w Olsztynie, Olsztyn.
6. Environmental Protection Plan for the Podlasie province 2011–2014.
7. Development Strategy for the Podlasie Province 2020.
8. Environmental Impact Assessment of the the Podlasie Province, 2011–2014.
9. Waste Management Plan 2012–2017 Podlaskie Voivodeship.
10. Act from 8th March 1990 about Municipal Government (Dz. U. z 2001 No. 142).