

Protection of surface waters in Lubuskie province in context of EU policies

Ochrona wód powierzchniowych w lubuskim w kontekście realizacji polityki UE

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Abstract

In this article author – based on literature, documents and statistical data - attempted to analyze the problem of protection surface waters in Lubuskie in the context of the implementation of European Union policy. A review of concepts relating to the EU Water Framework Directive and integrated water management was made. Investment activities in the field of water and wastewater were compared with environmental data in order to obtain a synthetic evaluation of the scale of the province. In summary applied conclusions.

Słowa kluczowe: zintegrowane zarządzania wodami, inwestycje, rozwój zrównoważony

Abstrakt

W opracowaniu podjęto – na podstawie literatury, dokumentów oraz danych statystycznych – próbę analizy problemu ochrony wód powierzchniowych w województwie lubuskim w kontekście realizacji polityki Unii Europejskiej. Dokonano przeglądu pojęć dotyczących Ramowej Dyrektywy Wodnej UE i zintegrowanego zarządzania wodami. Działania inwestycyjne w zakresie gospodarki wodno-ściekowej porównano z danymi środowiskowymi w celu uzyskania syntetycznej oceny w skali omawianego województwa. W podsumowaniu opracowania zawarto wnioski.

Introduction

The realization of the sustainable development principles are a constitutional order in Poland [1].

One of the main pillars of this policy is to care of the environment. The real challenge for developed countries is to reconcile pro ecology with initiatives to enhance the competitiveness of the economy. One of the most important element of this process is the development of infrastructure around environmental that helps to reconcile the aspirations of development with the attention to the ecosystem. Investments which support this process, however, are generally expensive and Polish governments without adequate support are not able to cope with bearing the financial burden. True help in

this range for the government is to being able to use the resources of European Union (EU). One of the investment directions in environmental protection is to protect the surface waters. In 1975, the European Community has implemented the 20 directives designed to restore the proper water quality in the Member States. The basic legal document, describing the principles of water management and water protection – the European Parliament and the Council are establishing a framework for Community action in the field of water policy, is known as the Water Framework Directive (WFD) [2]. WFD was implemented on 22nd December 2000. The principal message of the WFD is to protect water resources for future generations. The common European water policy aims to ensure people to have

access to clean drinking water at a price which takes into account the reimbursement of services, with simultaneous economic and social development and respecting the needs of the environment.

Water policy and integrated management of water resources in the EU

Integrated management of water resources is a method to organize the management processes of that sphere of environmental performance, increase its efficiency – also in terms of economic efficiency and innovation by improving communication and exchange of achievements in science and practice in a multidisciplinary section. Worrying signs that indicate the need for decisive action in this area are inconsistent economic instruments, the threat of flooding, the aggravating state of the waters, operating various types of water management, even in national terms, there is no uniform monitoring of waters and their classification, and it gives us in effect the lack of a coherent data base.

By introducing the integrated management of water quality Water Framework Directive establishes dependencies and eliminates many inconsistencies between the different directives on the protection of water quality in the Member States of the European Union. Good status for all waters by 2015 is achievable through: preventing further deterioration of aquatic ecosystems and protecting and improving the status of these ecosystems, meeting the water demand of population, agriculture and industry, promoting the sustainable use of water (based on long-term protection of available water resources), the implementation of projects aimed at the gradual reduction of emissions, discharges and losses of priority dangerous substances, ensuring a gradual reduction of pollution of groundwater, reducing the effects of floods and droughts. Environmental objectives are to protect all surface water and groundwater through: integrated water management based on river basins, control of emissions and water quality standards and the gradual elimination of dangerous substances, economic analysis and reimbursement of costs of water services for the sustainable use of water, involvement the community and water users in the process of water management.

The integrated management of water quality objectives are achievable with an integral approach to surface water and groundwater, basins-approach, and socialization process of decision making and consideration of environmental aspects. Assumptions of WFD foster the implementation of relevant programs and action to improve or maintain good

water status in each river basin and the management, protection, conservation of water resources implemented in the areas of hydrographic borders.

The Water Framework is part of the regulation system for water conservation. It consists of: so-called Directive “daughter”. Directive on water intended for swimming 76/160/EEC, Directive on drinking water 80/778/EEC changed 98/83/EC, Directive on Integrated Pollution Prevention and Control (IPPC), Directive 96/61/EC, Directive on Urban Waste Water Treatment 91/271/EEC, Directive 86/278/EEC on sewage sludge, Directive 91/676/EEC on nitrates. Complementary directives are: Directive 79/409/EEC on the birds, the Directive on major disasters (Seveso) 96/82/EC, Directive on Environmental Impact Assessment, 85/337/EEC, Directive on plant protection products 91/414/EEC, Habitats Directive 92/43/EEC.

The legal system and accompanying them actions form the so-called: Water Policy of the European Union. It consists: action to implement the WFD-transposition of legislation, economic instruments, control and enforcement, education and social dialogue. EU water policy aims to programming actions in four main areas: hydro-morphological changes (small retention programs, flood protection), agriculture (implementation of good agricultural practices), industry (the rationalization of water), municipal services (collection and wastewater treatment, development of waterworks). Already mentioned environmental objectives contain a diagnosis of the environmental elements (among others: typology and reference conditions and classification systems of water) and monitoring, management plans, action programs, economic instruments (economic analysis and reimbursement of costs of water services for the sustainable use of water, oriented not on the decision making process), public participation and inter-regional and international policy (areas of cooperation and forms of cooperation). Areas of cooperation include: international river basins, coordination, research work, new technologies, intercalibration. Among the forms of cooperation in this range, stand out: the committees, twinning, pilotage programs, workshops and other activities.

Poland as a member of the group actively participates in the EU water policy thanks to implementing WFD (transposition of the Water Law of 18th July 2001 (Journal of Laws of 2011, No. 32, Pos.) and the Environmental Protection Law of 27th April 2001 (Journal of Laws of 2008 No. 25, item 150), but it's needed to be stressed that the practical actions in this regard are supported in the form of help aid, which are used widely to improve the

quality of life in society which is the aim of idea of implementation the sustainable development [3, 4].

Lubuskie as a part of the Odra's river basin

The whole area of the Lubuskie Province lies in the middle of basin of the river. Odra is the sixth largest tributary of the Baltic Sea and is known to be a one of big rivers. Odra is a border river between the Polish and the Czech Republic, and between the Polish and German on the length of 161.7 km. It flows north a wide valley surrounded by forests between the shaft of Zielona Góra and the Lake District Sławskie to turn west to the border with Germany. By changing the direction to the north, the river breaks through the moraine hills of the Lubuskie Lake District, creating a Lubuski Gorge of Odra a variable width of the Odra valley with a large network of canals. Odra leaves the region through the valley of the Toruń-Eberswald. In the valley of the Odra river are shallow, narrow river oxbow lakes, and river flood waters resulting from the accumulation of water by alluvial cones in the lower reaches of tributaries (e.g. Warta). Odra is connected to the channels with the German rivers (Spree / Havel) and the Upper Silesian Industrial District, and the Gliwice Canal with the Wisła by the Bydgoszcz Canal.

The main and largest river in this area is Odra, the largest left-sided tributaries are: Opawa (Opava), Nysa Kłodzka, Bystrzyca, Bóbr, Nysa Łużycka, and the largest tributaries of the right side is: Mała Panew, Widawa, Barycz, Warta, Myśla, Ina. The largest river among listed tributaries is Warta with its main left-sided tributaries: Proсна and Obra. Odra's basin area also includes the Baltic Sea basin and the rivers: Dziwna, Rega, Parsęta and Wieprza [5].

The total length of the Odra is 855 km, but inside the Polish border Odra is 742 km. The river Oder is navigable over a distance of 711 km. Elevation above sea level, the source is 634 m above sea level, and the mouth of 0 m, the average flow profile in the mouth of the years 1951–2000 amounts to 567.0 m³/s (peak in Nowa Sol in 1997 – 3040 m/s). Average annual rainfall for the part passing among the mountain ridges is 1000–1400 mm, while for the greater part of the river basin are 500–600 mm. The largest tributary is Warta with river basin with an area of 54,529 km² lying on Polish territory, length: 808 km. Warta over a length of 407 km is navigable river. Elevation of the source is 384 m above sealevel and mouth – 11 m above sealevel. Average flow profile in the mouth of the years 1951–2000 amounts to 216.0 m³/s. From

Czech two rivers flow into Odra, while from the Polish territory 43 tributaries of varying sizes. Warta as the only river in the Odra basin is classified as a medium size river. Overall in the Lubuskie province are 418 rivers, canals and other watercourses of a significant size, with a total length of 4600 km. Many smaller rivers have basins located entirely within the province. 11% of the region are occupied by watersheds of Noteć and Nysa Łużycka, 12% – Bóbr, 28% – other part of the Warta, and 38% – the other part of the Odra [6].

In the Odra's basin has been identified 9 types of lakes. The total number of lakes with an surface greater than 0.5 km² is 420 and is equal to the number of separate parts of water. The northern part of the Lubuskie Province, north of the Odra valley, has a relatively high rate of ratio of lake surface to surface area, amounting to 2–3%, in contrast to the other part, situated below the line of the last glaciation, where this ratio is less than 0,1%. In the region there is a 519 lakes. The total surface of lakes in Lubuskie is 13009.8 ha, what represents 0,93% surface of the province. The largest lake is Lake Sławskie which has area of 817,3 ha water surface, and then Osiek with Ogardzka's arm (532,5 ha) and Niesłysz (486,2 ha). Lubuskie's deepest lake and the tenth in Poland is lake Ciecz (Trześniowskie) – 58,8 m, more than 40 m deep lake is also Lipie (42,0 m). The largest volume of water store the lakes: Osiek – more than 50 million m³, Sławskie – 42,6 million m³ and Ostrowiec – 36,4 million m³.

Due to transit and next to the border location, a significant influence on water quality in the Lubuskie province have different types of pollution sources located in the provinces: Silesia, Lower Silesia, Opole and the Wielkopolska and also the Czech Republic and Germany. Therefore, the management of the basin exceeds the powers of local government units for the purpose set (Regional Water Management in Gliwice, Poznan, Szczecin, Wrocław) in the Odra's basin, an Act was implemented on 6 July 2001 establishing a long-term "Program for the Odra River – 2006" (Journal of Laws No. 98, item 1067, as amended. d.), which creates a platform for cooperation between the authorities which are implementing the policies in this area as well as social and academic environments. This program is implemented in cooperation with international partners [7, 8].

An international, bilateral cooperation in water management with the Czech Republic, the Federal Republic of Germany is conducted in the Odra river basin, which is based on the following agreement:

1. Agreement of 19th May, 1992 between the Polish Republic and the Federal Republic

of Germany on cooperation in the field of water management on boundary waters. To realize this act the Polish-German Commission for the Boundary Waters was established. The Commission established five working groups, in work are involved representatives of IMGW, RBWM, PIOŚ and local authorities. Responsible for the implementation of this Agreement is the Minister of the Environment.

2. Agreement of 7th April, 1994 between the Government of the Polish Republic and the Government of the Federal Republic of Germany on cooperation in environmental protection. The Polish-German Environment Council was established for the implementation of this agreement.

3. Agreement of 8th November, 1991 between the Government of the Polish Republic and the Government of the Federal Republic of Germany on the inland navigation. To implement this agreement has been established the Polish-German Commission for Inland Navigation.

4. Agreement of 21st March, 1958 between the Government of the Polish People's Republic and the Government of the Republic of Czechoslovakia on water management on boundary waters. To perform the tasks arising from this agreement, the contracting parts have designated their representatives.

5. Agreement of 15th January, 1998 between the Government of the Polish Republic and the Government of the Czech Republic on cooperation in environmental protection. For the implementation of this agreement, the Polish-Czech Committee for Cooperation in the field of environmental protection was established.

6. Agreement of 11th April, 1996 on the International Commission for the Protection of the Odra against Pollution. Sides of this agreement are: Poland, Czech Republic, Germany and the European Union. To implement this agreement, the Commission was formed, consisting of five members and five representative from each Contracting Side. As a part of the Commission established the following six working groups: the Program of Action, the Extraordinary Pollution, Law and the Organization, the Flood, for Ecology, for the Implementation of Water Framework Directive.

These and other activities of an international nature in the area of the Odra River are discussed in the pages of the Ministry of Environment.

Analysis of problems of water-sewage management in Lubuskie province

Evaluation of water pollution in rivers (continental divide of the Odra) in the area of Lubuskie was made by the Monitoring Water Quality IMGW

in Katowice in 2007, based on the regulation of Minister of Environment of 20th August, 2008 on the classification of single parts of surface water (Journal of Laws No. 162, item 1008) [9]. Water quality in the province of Lubuskie is determined by intake of water, disposal to water an industrial waste water and a inflow of pollutions of the so-called spatial sources. Based on the results of examine of the rivers and lakes from the years 2004–2007 was assessed a degree of risk to eutrophication of waters due to “discharge” of sewage (at 97 points of measurement and control (ppk) on the rivers and the lakes in 36 ppk). Accordingly, eutrophication was found in 76% ppk on rivers and 53% ppk on lakes. Studies have shown varying quality of water quality in the Lubuskie province, in the north – most of the monitored lakes is characterized by good quality water, while waters located in the southern part of the province are more eutrophicated. Determining indicators of water quality of lakes are mainly nitrogen and phosphorus compounds. Status of single parts of the Odra river basin in 2008 – 1673 – separated along, a good – 67, bad – 1383 [10, 11].

In last years, there has been reduced pressure to industrial pollution sources due to industrial restructuring and in connection with limited amounts of non-purifying water entering the water from industrial sources. The impact of urban wastewater was limited through the construction of modern, highly efficient wastewater treatment plants and upgrading existing treatment plants. As a result, pressure and the importance of pollution, whose sources are located in countryside, increased. It is very important, especially for quality of smaller water of rivers and streams, that there are occurring in these areas the disparity between facilities in the town water supply and sanitation (the length of the water supply network was in 2000 – 4808.5 km, and 2005 – 5496.1 km and the length sewerage network was – in 2000 – 1323 km, and in 2005 – 1995.4 km). Equipment apartments in the water supply – in 2005 – 98.9% in 2008 – 99.1%. Population using wastewater in 2009 – 86.7%, with the water supply – 95.6%, equipment of the wastewater treatment facilities in the city's population – 93.8%, countryside – 15, 8% [12, 13]. In this range, since 2001, the access to sewerage for urban population improved about 3.8%, a village about 1%. In the years 2002–2009 has decreased the amount of waste arising per household of 30,863 m³. In 2002 it amounted to a total – 39.6 hm³, in 2004 – 38.2 hm³, in 2007 and 2008 – 36.0 hm³, while in 2009 – 35.3 hm³. Number of discharged industrial wastewater has decreased in 2004–2008 by about 13.6%,

and the amount of generated waste water was lower by about 4% [14]. Of all the sewage (treatment needed) in 2004 there was 9.8% accounted not cleaned wastewater. In 2005–2006 this number dropped to 8.3%, while in 2008 to 5.1% and in 2009 to 4.2%. In the period 2004–2008 increased to 94.9% (in 2008) the quantity of treated wastewater in relation to the total amount of generated wastewater.

Excepting the “discharge points” of the wastewater, the relevant problem of water quality are spatial sources of pollution – rainfall causes input of air pollution and surface runoff from fields, pastures and meadows, which are a significant source of biogenic substances (mainly nitrogen and phosphorus), responsible for eutrophication of surface waters. Years 2004–2008 in Lubuskie are characterized by increasing consumption of fertilizers in terms of pure ingredient for the marketing year, expressed in kg/ha of agricultural land in 2001/2002 – 93.9 kg/ha, 2002/2003 – 97.6 kg/ha, 2003/2004 – 111.9 kg/ha, 2004/2005 – 115.5 kg/ha, 2008/2009 – 120 kg/ha. Besides, the application of nitrogen is systematically increasing from 56.9 kg/ha in 2001/2002 to 71.2 kg/ha in 2009, and phosphorus on initial growth in the years 2001/2005 from 18.1 kg/ha to 25.6 kg/ha, but in 2009 decreased to 21.7 kg/ha. The increased use of fertilizers is noticeable in the form of pollution of the Odra tributaries, especially the small streams that flow through lands in Lubuskie (e.g. around Międzyrzecz, Gorzów Wielkopolski, Świebodzin, Wschowa, etc.) [13, 15] used for intensive agricultural purposes.

Table 1. Selected indicators for wastewater management in Lubuskie province [source: authors' own research]

Tabela 1. Wybrane wskaźniki w gospodarowaniu ściekami w lubuskim [źródło: badania własne]

Data for the years 2000/2005	Total	Mechanical	Chemical	Biological	With the increased removal of nutrients
Industrial wastewater treatment					
Number of treatment plant	51/47	14/13	7/6	28/26	2/2
Throughput in m ³ current / installed	86681 / N.A.	45236 / N.A. 15721 / 30452	7800 / N.A. 3904 / 5429	18245 / N.A. 18910 / 17106	15400 / N.A. 4063 / 15072
Municipal wastewater treatment					
Number of treatment plant	84/90	7/2	–	60/63	17/25
Throughput in w m ³ /d	220757 / 235000	14513 / 533	–	52581 / 65294	153663 / 165505

There are five cities in Lubuskie recognized as a city with a large-scale sewage threat. They are: Gorzów Wielkopolski – 5821 R-hm³, Zielona Góra – 5420 R-hm³, Kostrzyn nad Odrą – 3776 R-hm³, Żary – 2127 R-hm³, Nowa Sól – 1581 R-hm³ [13].

Investments with the support of EU's funds which support improvement of water quality in Lubuskie

Pre-accession help, which was implemented in the programs PHARE, SAPARD, ISPA allowed the implementation of many significant investments particularly in the sewage and waste's management. They allowed for a significant improvement in the environment area of Gorzów and Zielona Góra province, which after correction of this area since 1999, became part of the current Lubuskie and upgraded through the modernization of the state for the protection of the environment infrastructure. In total, during this period it was made 29 major projects in this field for more than 31 million euro – it is about 124 million zł. The biggest of these is: “The common effluent treatment plant for the town of Gubin – Guben and extension of sewerage of the city” (3.3 million euro), “Construction of sewage treatment plant for the city Lubsko” (3 million euro), “Improving sanitation and localization conditions in the municipalities of the Union Municipalities deliberate MG-6 through the construction and integration of their sewage systems with wastewater treatment plant in Gorzów Wielkopolski and the protection of the main aquifer 137 Warta (Kostrzyn-Santok)” (3.0 million euro), “Construction of sewage treatment plant with sewerage system in Iłowa” (2.6 million), “Construction of sewage treatment plant for the town of Krosno Odrzańskie” (2.56 million euro), “Central Wastewater Treatment Plant in Zielona Góra” (2.3 million euro), “Modernization of the sewage treatment plant in Gorzów Wielkopolski – Second phase of construction of sewage treatment plant for Zakanala” (1.8 million euro), “Construction of sewage treatment plant in Żagań” (1.3 million euro) and others [16].

Support which Gorzów Wielkopolski and Zielona Góra region got in the nineties, resulted in very dynamic growth in the sewerage system and thus the number of population of the area served: 1995 – 362502 population, 2002 – 632479 inhabitants. In 2004–2006 under the Integrated Regional Development Operational Program allocation for Lubuskie was 82.55 million euro. Of this amount, for the purposes of waste management 40 projects were made for a total amount – 247,312,656.74 PLN. The largest project in this regard was the

project “Sewage management in the Zielona Góra and Świdnica” for the amount – 119,661,608.18 PLN, and “Water and wastewater economy in the municipality of Świebodzin” – 61,113,528.00 PLN and others.

In the years 2000–2008, 26 sewage treatment plants were built or upgraded. In 2009, total in the region 86 sewage treatment plants functioned. Their total capacity was 235 thousand m³/d. All newly constructed or upgraded sewage treatment plants are mechanical-biological and they use method of activated sludge, with the possibility of reduction of phosphorus compounds. It should be pointed out that more and more often wastewater is used for agricultural purposes, such as for irrigation of willow plantations. Among modernized treatment in recent years, Sława object should be highlighted, where treated sewage are no longer directed to the receiver (it was a Czernica river and then Lake Sławskie), but pumped at a distance of 3 km to the additional built filter fields [17].

In 2004–2008, the number of people connected to the sewage treatment plant was systematically increasing. In 2004 that number was 62,7%, while in 2008 – 68,4% (in 2000 – 59%) of the general society. In absolute numbers: 1995 – 362,502 inhabitants (the sum of the two provinces – Gorzów and Zielona Góra), 2002 – 632,479 inhabitants, 2008 – 690,132 population. In the period 2004–2008, the number of people connected to the mechanical treatment plants for biological treatment has been reduced, especially with third-degree sewage treatment. In 2004, 43.3% of the population was served by treatment plants with enhanced nutrient removal, in 2008 the figure was 48.8% and in 2009 – 67.4%.

In conclusion, in this period in the wastewater management occurred qualitative transformation as a result of investments made. Because of decreased amount of wastewater, the main aim was to increase the quality of treated wastewater and the rationalization of water and sewage management. “The main reason for the increase of population connected to a mechanical-biological treatment is not so much the construction of new facilities or upgrading existing ones, which was the expansion of sewer systems, is also covering the villages. This is in large part the effect of use of funds of the European Union under the National Program for Municipal Wastewater Treatment” [18]. Systematic investment effort over these years has brought measurable benefits in terms of water – wastewater management in the region. Number of untreated industrial and municipal has decreased (CSO gives – km² in dam³ from 0.3 in 2000 by 0.2 in 2005 to 0.1 in 2008). The number of people benefiting from

treatment plants in the same period increased from 59.9% by 64% to 68.4%. Other effects, which as a result of systematic monitoring of the environment by the State WIOŚ in Zielona Góra, are shown in subsequent annual reports. The submitted statement is clearly visible effort of the major of public units, but also private investors.

As a part of National Cohesion Strategy for years 2007–2013, the Lubuskie region for investments in the region will receive 591.18 million euros of EU funds. These projects are implemented with the Operational Program: Infrastructure and Environment, and are: “Water and wastewater economy, city of Nowa Sól and neighboring municipalities” – the value of the project: 48.36 million euro, amount of grant funds: 28.08 million, a period of implementation of the project: 2007–2010; Project: “Arrangement of the water and sewage in the area of the Association of Municipalities of MG-6” – the value of the project: 75.56 million, amount of grant funds: 44.96 million, the duration of the project: 2008–2011; Project: “Cleaning up waste water in the area of intercommunal Association of Rural Water Supply and Sewerage Wschowa” – the value of the project: 69.90 million, amount of grant funds: 41.59 million, the duration of the project: 2009–2012; Project: “Construction and modernization of the network and water – sewage devices in agglomeration Żary – the first stage” – the value of the project: 25.70 million, amount of grant funds: 14.82 million, the period of investment: 2009–2012; Project: “A comprehensive solution for wastewater treatment in agglomerations Szprotawa” – the value of the project: 14.28 million, amount of grant funds: 8.50 million, the investment implementation period: 2008–2011; Project: “Organizing wastewater in the agglomeration of Krosno Odrzańskie” – the value of the project: 12.90 million, amount of grant funds: 7.68 million euros, the investment implementation period: 2008–2011; Project: “Development and modernization of the waste economy system for Zielona Góra” – the value of the project: 6.70 million euros, the value of subsidies from EU funds: 3.69 million, the investment implementation period: 2007–2010; Project: “Wastewater economy within the districts Żagań and Żarski” – the value of the project: 18, 04 million euros, the value of grant funds: 9.92 million, the duration of the project: 2008–2011 [19].

On the reserve list, there are 7 projects from Lubuskie province for the total amount: 88.91 million. Lodged projects for the new programming period 2007–2012 in Lubuskie Regional Operational Program – Action 3.1 “Infrastructure of the protection of natural environment” – made a total of 27

projects. Most of them concern the ordering of smaller urban wastewater economy, and village areas. Implementation of these projects will contribute significantly to further reduce of pressure on the environment and consequently to improve the quality of the waters of the Odra river basin.

Conclusions

EU water policy, which Poland also implements, head for programming actions in four main areas: hydromorphological changes (small retention programs, flood protection), agriculture (implementation of good agricultural practices), industry (the rationalization of water economy), municipal services (collection and treatment sewage, waterworks development). All these activities are aimed at counteracting the effects of human impact in the environment. Odra is a river which is safeguarded actions and will continue to improve its state of purity. Integrated management of the basin is an opportunity for consistent implementation of projects for rehabilitation of natural, economic and social functions of rivers. Investments, made by Lubuskie governments with the support of national and European funds, are part of an integrated management system implemented by Poland accordance with RWD. Systematic investment effort over these years has brought measurable benefits in terms of water – wastewater management in the region. Number of industrial and municipal untreated sewage decreased from 0.3 dam³ in 2000 by 0.2 dam³ in 2005 to 0.1 dam³ in 2008. Number of people benefiting from treatment plants in the same period increased from 59.9% by 64% to 68.4%. Other effects, which as a result of systematic monitoring of the state of environment by WIOS in Zielona Góra are shown in next annual reports. In the extended statement, it is clearly visible this positive effect of the investment effort made by most public entities, but also private investors. Further implementation will allow them to better manage the economy of water and sewage, which is an integral component of sustainable development policies.

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