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Original Research Article

WATER AND SEWAGE MANAGEMENT IN THE DISTRICTS OF LUBUSKIE VOIVODESHIP, POLAND

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A b s t r a c t

Since 1991, Poland has been taking steps to organize the country's wastewater management in order to meet the requirements of Council Directive 91/271/EEC. The current goals to achieve the said requirements are set in the VI update of the National Urban Wastewater Treatment Program (KPOŚK) and has to be achieved to 2027. The article presents the status of water and wastewater management in the districts of Lubuskie Voivodeship, Poland in 2021, in relation to year 2017. The degree of water supply and sewerage system, as well as wastewater systems management in individual agglomerations of Lubuskie Voivodeship are defined.

Keywords: water system supply, WWTP, sewage system, rural and urban area

1. INTRODUCTION

One of the directions of water protection is to protect it from pollution from insufficiently treated wastewater. When Poland joined the European Union, it undertook to meet the requirements of Council Directive 91/271/EEC of May 21, 1991 concerning urban wastewater treatment [1] in accordance with the deadlines and transition periods specified in the negotiations and enshrined in the Accession Treaty. The National Urban Wastewater Treatment Program (KPOŚK) was created to identify the needs for orderly wastewater management and to monitor

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the implementation of investments in this area to achive treaty obligations. The program was updated six times in the years: 2005, 2009, 2010, 2015, 2017 and 2022. To date, the pace of implementation of investments under the AKPOŚK V has not ensured the achievement of the milestones specified in the Accession Treaty. Currently, 849 agglomerations (50.33% of the total PE of agglomerations) comply with the conditions of Directive 91/271/EEC, while 675 agglomerations (49.67% of the total PE of agglomerations), do not meet these conditions. In order to fulfill accession obligations, the following are planned by 2027: construction of 14,241km of new sewerage network, modernization of 3,173 km of existing sewerage network, construction of 103 new municipal wastewater treatment plants, modernization of 362 wastewater treatment plants, expansion of 117 wastewater treatment plants, expansion and modernization of 570 wastewater treatment plants, modernization of the sludge part in 225 wastewater treatment plants and decommissioning of 58 wastewater treatment plants. The cost of the planned activities included in the AKPOŚK 2022 is more than PLN 42 billion [2]. In order to optimize the activities planned in the AKPOŚK 2022, areas and boundaries of agglomerations were determined, taking into account the concentration index, the extent of the sewage network system and the extent of the system planned for construction of the sewage network [3]. The following wastewater treatment systems are distinguished in agglomerations: PUB1 - biological treatment plant with enhanced removal of nitrogen (N), phosphorus (P) compounds meeting the standards of discharged wastewater for agglomerations ≥ 100,000 PE; non PUB1 - treatment plant as above, not meeting the standards of discharged wastewater for N and/or P removal; PUB2 - biological treatment plant with enhanced removal of nitrogen (N), phosphorus (P) compounds meeting the standards of discharged wastewater for agglomerations < 100,000 PE; non PUB2 - treatment plant as above. not meeting discharge standards for removal of N and/or P; B - biological treatment plant meeting discharge standards Non B - biological treatment plant not meeting discharge standards [4].

2. WATER AND WASTEWATER SYSTEMS IN THE DISTRICT OF LUBUSKIE VOIVODSHIPS

Lubuskie province (Poland) is formed by 12 districts with a total area of 13988 km² and a population of 993329 [5]. The equipment of Lubuskie Voivodeship in water supply and sewerage infrastructure is at a similar level to the average in Poland (Fig.1). In 2020, the length of the operational water supply network in Lubuskie Province was 7176.1km. 94.8% of the province's residents were connected to the network, including 97.3% of urban residents and 90.1% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply network in relation to the total number of residential

buildings, it was 88.5%, respectively 88.2% in cities and 88.9% in rural areas. The average consumption of water from waterworks in households per capita in the province was 31.8m^3/PE (33.3 m^3/PE in urban areas and 29.1 m^3/PE in rural areas). The length of the sewerage network in Lubuskie Province in 2020 was 4611.4 km. 74.7% of the province's population was connected to the sewerage network, including 91.9% of the population in cities and 43.1% of the rural population.

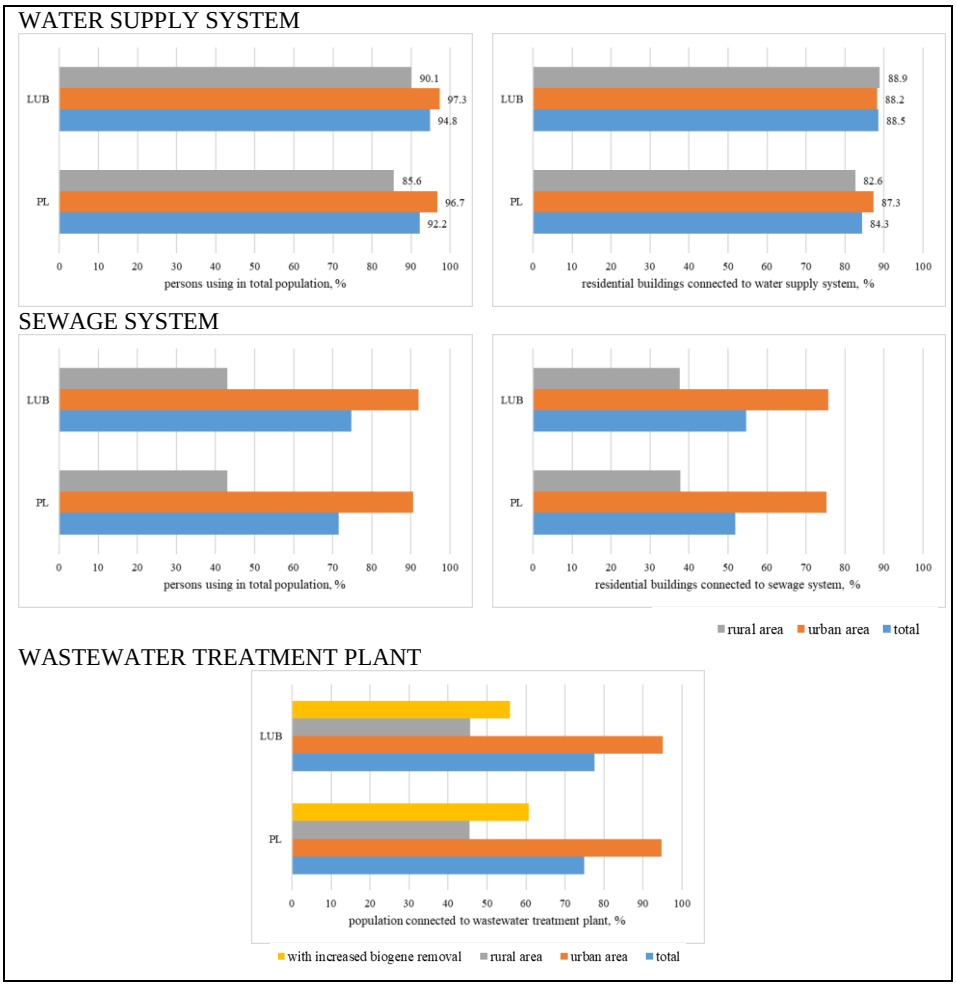


Fig. 1. Water and wastewater systems in Lubuskie Voivodeship and in Poland

On the other hand, taking into account the number of buildings connected to the sewer system in relation to total residential buildings, it was 54.7%, respectively

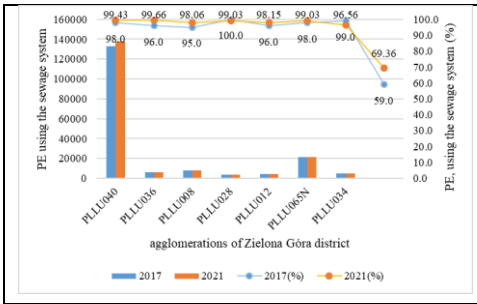
75.7% in cities and 37.6% in rural areas. The length of the sewerage network in relation to the length of the water supply network was 57.44%, for Poland this indicator was at 51.33%. Wastewater treatment plants were used by 77.5% of the province's population (60.7% of which were systems with enhanced nutrient removal), respectively 95% of the urban population and 45.6% of the rural population.

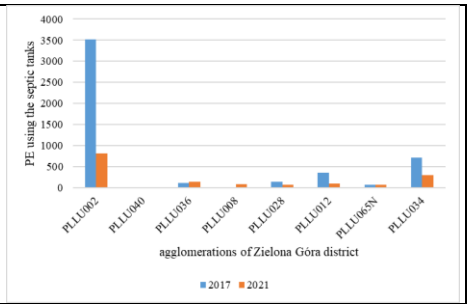
2.1. Zielona Góra district

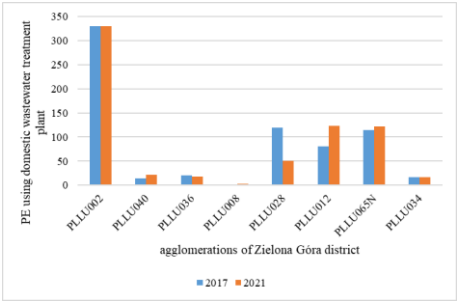
Zielona Góra district is located in the southern part of Lubuskie Voivodeship, covering an area of 1349.75 km^2 (9.7% voivodeship's area). The district is made up of 9 municipalities: 5 urban-rural municipalities: Babimost, Czerwieńsk, Kargowa, Nowogród Bobrzański and Sulechów, and 4 rural municipalities: Bojadła, Świdnica, Trzebiechów and Zabór. In 2020, the length of the operational water supply network in Zielona Góra district was 73.6km. There were 72830 district residents connected to the network (about 96.2% of the district's total population), including 96.6% of urban residents and 96% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to total residential buildings, it was 92.7%, respectively 95.1% in cities and 91.8% in rural areas. The lowest degree of water supply is in the rural areas of the Kargowa municipality, at 75.6%. In 2020, total household water consumption was 2326dam^3. The average consumption of piped water in households per capita in the district was 30.7m^3. The highest water consumption per capita was recorded in the municipality of Babimost-rural area (51.8m^3/PE) and the lowest in the municipality of Swidnica (19.6m^3/PE). The length of the sewerage network in the Zielona Gora district in 2020 was 438.6 km. To the sewerage network were connected 51206 residents of the district (67.7% of the total population of the district), including 92.8% of the population in cities and 48% of the rural population. On the other hand, taking into account the number of buildings connected to the sewer system in relation to the total number of residential buildings, it was 57.1%, respectively 87.2% in cities and 45.6% in rural areas. The municipality with the lowest degree of sewerage of 19.8% is the rural municipality of Trzebiechów. The length of the sewerage network in relation to the length of the water supply network was 59.3% [6, 7].

Wastewater systems in Zielona Góra district by agglomeration are shown in Fig.2. There has been eight agglomerations designated in Zielona Gora district: Zielona Góra (PLLU002) [8], Babimost (PLLU040) [9], Czerwieńsk (PLLU036) [10], Kargowa (PLLU008) [11], Nowogród Bobrzański (PLLU028) [12], Sulechów (PLLU012) [13], Świdnica (PLLU065N) [14], Trzebiechów (PLLU034) [15]. The annual volume of wastewater discharged to the wastewater treatment plant in 2020 was 2754 dam^3. The total capacity of wastewater treatment plants located in Zielona Góra district is 14145m^3/d. Wastewater

treatment plants in Zielona Gora district in 2020 were used by 53610 people (of which 16% used wastewater treatment plants with enhanced nutrient removal), which is 70.8%, in the total population of the district; 94.1% in urban areas and 52.6% in rural areas. There are 4334 non-drainage tanks for liquid waste storage and 1,067 household wastewater treatment plants in Zielona Góra district [6,7].







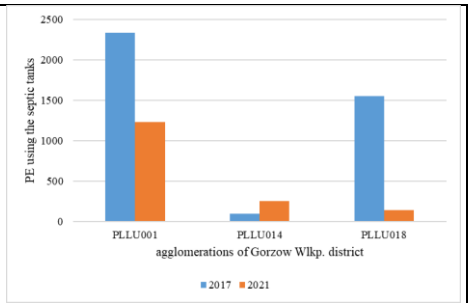
		Zielona Góra WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU002 PUB1 21255m^3/d (199 209) Łącza canal in km 2+565
		Babimost WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU040 B 1000m^3/d (6483) Gniła Obra in km 11+800
		Czerwieńsk WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU036 B 1600m^3/d (11000) Łącza river in km 3+020
Kargowa WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU008 PUB2 9000m^3/d (7834) Dźwiński canal in km1+930	Nowogród Bobrzański WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU028 B 931m^3/d (6005) Bóbr river in km47+155
Sulechów WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU012 PUB2 6500m^3/d (26500) Sulechówka river (R-S1)	Trzebiechów WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU012 B 1950m^3/d (9200) Młynówka canal in km6+000
Świdnica PLLU065N			
WWTP type Q, m^3/d (PE) Wastewater receiver	B 220m^3/d (2000) Zimna Woda canal in km 16+250	WWTP type Q, m^3/d (PE) Wastewater receiver	B 450 m^3/d (4500) Wodna canal in km 6+580

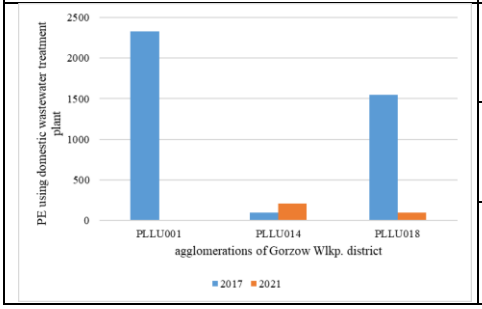
Fig.2. Wastewater systems in agglomeration of Zielona Góra district

2.2. Gorzów Wielkopolski district

Gorzów Wielkopolski district is located in the central-eastern part of Lubuskie Voivodeship and covers an area of 1214 km^2, which is 8.7% of the voivodeship's area. Gorzów district consists of 7 municipalities: 1 urban municipality: Kostrzyn-on-Odra, 1 urban-rural municipality: Witnica and 5 rural municipalities: Bogdaniec, Deszczno, Kłodawa, Lubiszyn and Santok. In 2020, the length of the

operational water supply network in Gorzów Wielkopolski district was 852.8 km. There were 67511 county residents connected to the network (about 93.4% of the county's total population), including 98.4% of urban residents and 90.8% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to total residential buildings, it was 90.5%, respectively 93.3% in cities and 89.9% in rural areas. The lowest degree of water supply is in the rural areas of Witnica municipality, at 80.9%. In 2020, overall household water consumption was 2206.1dam^3. The average consumption of piped water in households per one inhabitant of the district was 30.6m^3. The highest water consumption per capita was recorded in the municipality of Kostrzyn-on-Odra (309.4 m^3/PE) and the lowest in the municipality of Deszczno (30.6 m^3/PE).





Gorzów Wlkp. WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU001 PUB1 27000m^3/d (239 800) Warta river in km 51+400
Kostrzyn nad Odrą WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU014 PUB2 5943m^3/d (25 725) Odra river in km 617+700
Witnica WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU018 PUB2 2400m^3/d (27000) Mały canal

Fig. 3. Wastewater systems in agglomeration of Gorzów Wielkopolski district

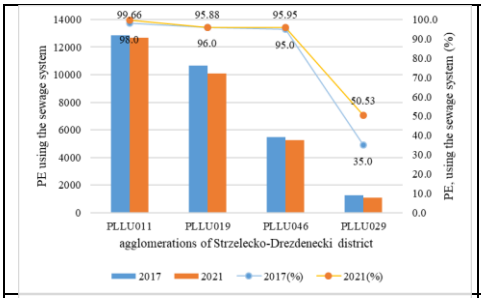
The length of the sewerage network in the Gorzow district in 2020 was 495.1km. There were 51393 residents of the district (71.1% of the district's total population) connected to the sewerage network, including 93.9% of the population in cities and 59.5% of the rural population. On the other hand, taking into account the number of buildings connected to the sewer system in relation to total residential buildings, it was 55%, respectively 74.1% in cities and 50.9% in rural areas. The municipality with the lowest degree of sewerage of 19.7% is the rural municipality of Witnica. The length of the sewerage network in relation to the

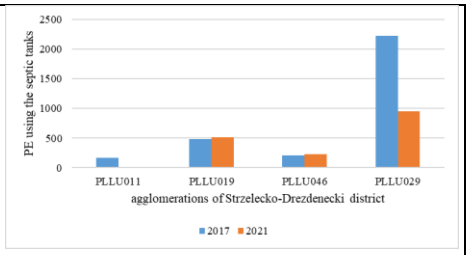
length of the water supply network was 58.06% [6,7]. Wastewater management systems in Gorzów Wielkopolski district by agglomeration are shown in Fig.3. Within the Gorzów Wielkopolski district, 3 agglomerations were designated: Gorzów Wlkp. (PLLU001) [16], Kostrzyn-on-Odra (PLLU014) [17] and Witnica (PLLU018) [18]. The total annual amount of wastewater discharged from Gorzów Wielkopolski district in 2020 to the treatment plant was 2100 dam^3. The total capacity of wastewater treatment plants located in Gorzów Wielkopolski district is 29359 m^3/d. Wastewater treatment plants in Gorzów Wielkopolski district in 2020 were used by 48083 people (of which 64.1% used wastewater treatment plants with enhanced nutrient removal), which is 66.5%, of the total population of the district; 94.7% in urban areas and 52.2% in rural areas [6,7].

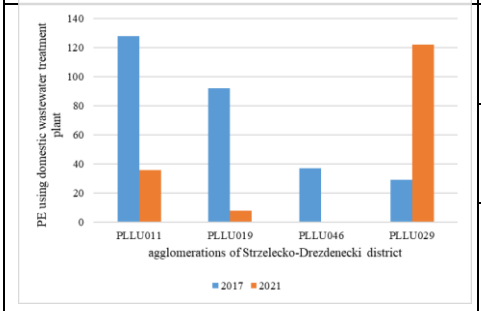
2.3. Strzelce Krajeńskie-Drezdenko district

Strzelce Krajeńskie-Drezdenko district is located in the northeastern part of Lubuskie Voivodeship, covering an area of 1248 km^2, which is 8.9% of the voivodeship's area. This district is made up of 5 municipalities: 3 urban-rural municipalities: Strzelce Krajeńskie, Dobiegniew, Drezdenko and 2 rural municipalities: Zwierzyn, Stare Kurowo. In 2020, the length of the operational water supply network in the Strzelce Krajeńskie-Drezdenko district was 569 km. To the network were connected 45,289 residents of the district (about 93.1% of the total population of the district), including 98.2% of urban residents and 88.7% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to the total number of residential buildings, it was 91.3%, respectively 95.9% in cities and 89.2% in rural areas. The lowest degree of water supply is in the rural areas of the Drezdenko municipality, at 74.2%. In 2020, total household water consumption was 1515.1 dam^3. The average consumption of piped water in households per capita of the district was $31m^3$. The highest water consumption per capita was recorded in the urban municipality of Dobiegniew (41.4 m^3/PE), and the lowest in the rural municipality of Drezdenko (19.4 m^3/PE). The length of the sewerage network in the Strzelce Krajeńskie-Drezdenko district in 2020 was 225.4 km. 27,067 residents of the district (55.7% of the total population of the district) were connected to the sewerage network, including 92.6% of the population in urban areas and 23% of the rural population. On the other hand, taking into account the number of buildings connected to the sewer system in relation to total residential buildings, it was 42%, respectively 89.2% in cities and 20.6% in rural areas. The municipality with the lowest degree of sewerage of 8.2% is the rural municipality of Drezdenko. The length of the sewerage network in relation to the length of the water supply network was 39.61% [6,7]. Wastewater management systems in Strzelce Krajeńskie-Drezdenko district by agglomeration are shown in Fig.4. In

Strzelce Krajeńskie-Drezdenko district, 4 agglomerations have been designated: Strzelce Krajeńskie (PLLU011) [19], Drezdenko (PLLU019) [20], Dobiegniew (PLLU046) [21] and Stare Kurowo (PLLU029) [22].







Strzelce Krajeńskie WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU011 PUB2 3000m^3/d (27500) Młynówka in km 5+800
Drezdenko WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU019 PUB2 1850m^3/d (13633) Noteć river in km 38+100
Dobiegniew WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU046 B 600m^3/d (6258) Mierzecka Struga river in km 23+044
Stare Kurowo WWTP type Q, m3/d (PE) Wastewater receiver	PLLU029 B 610 m3/d (8601) Klesno

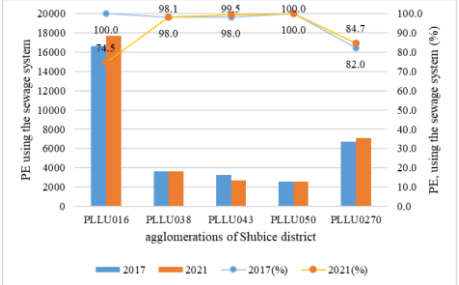
Fig.4. Wastewater systems in agglomeration of Strzelce Krajeńskie-Drezdenko district

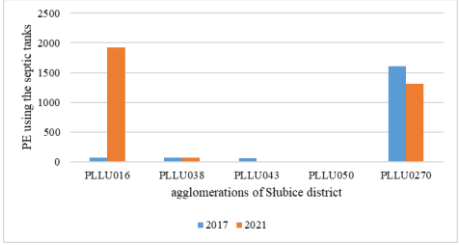
The annual volume of wastewater discharged to the wastewater treatment plant in 2020 was 953 dam^3. The total capacity of wastewater treatment plants located in the Strzelce-Drezdenko district is 9,900 m^3/d. Wastewater treatment plants in the Strzelce-Drezdenko district in 2020 were used by 29,759 people (of which 25.9% used wastewater treatment plants with enhanced nutrient removal), which is 61.2%, in the total population of the districtis; 95.4% in urban areas and 31% in rural areas. On the territory of the Strzelce Krajeńskie-Drezdenko district, there are 4,031 non-drainage tanks for storing liquid waste and 531 household sewage treatment plants [6,7].

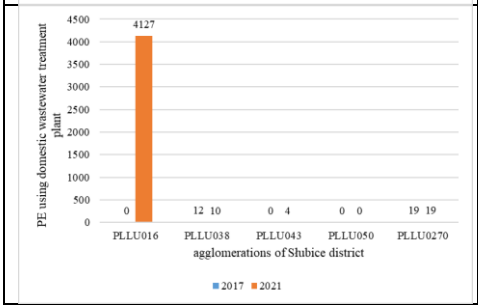
2.4. Słubice district

Słubice district is located in the western part of Lubuskie Voivodeship, occupies an area of 999 km^2, which is 7.1% of the voivodeship's area. Słubice County is formed by 5 municipalities: 4 urban-rural municipalities: Słubice, Ośno Lubuskie,

Rzepin, Cybinka and 1 rural municipality: Górzyca. In 2020, the length of the operated water supply network in the Słubice district was 368.4 km. There were 43,686 county residents connected to the network (about 93.1% of the county's total population), including 94.8% of urban residents and 90.1% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to the total number of residential buildings, it was 90.1%, respectively 94.4% in cities and 85.6% in rural areas. The lowest degree of water supply is in the rural areas of Rzepin municipality and is 79.4%.







Słubice WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU016 PUB2 4700m^3/d (24658) Czarny canal in km 7+360		
Górzyca WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU050 B 363 m^3/d (3300) Racza Struga		
Cybinka WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU043 B 330m^3/d (3300) drainage ditch		
Ośno Lubuskie WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU038 B 816 m^3/d (6800) Ośnianka river in km 19+543	Rzepin WWTP type Q, m^3/d (PE) Wastewater receiver WWTP type Q, m^3/d (PE)	PLLU0270 B (in Rzepin) 1205 m^3/d (7425) Ilanka river in km29+800 B (in Drzeńsk) 240 m^3/d (3600)

Fig.5. Wastewater systems in agglomeration of Słubice district

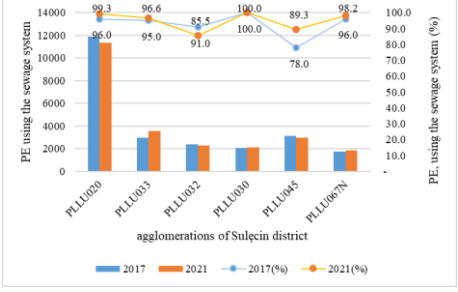
In 2020, the total household water consumption was 1,714.5 dam^3. The average consumption of piped water in households per capita of the district was 36.6 m^3. The highest water consumption per capita was recorded in the rural municipality of Słubice (51.7 m^3/PE) and the lowest in the municipal municipality of Ośno Lubuskie (25.4 m^3/PE). The length of the sewerage network in the Słubice district in 2020 was 211.7 km. There were 33,639 residents of the district (71.7% of the total population of the district) connected to the sewerage network, including 92.6% of the population in urban areas and 35.3% of the rural population. On the

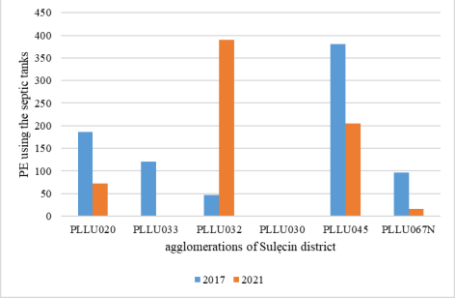
other hand, taking into account the number of buildings connected to the sewer system in relation to total residential buildings, it was 59.8%, respectively 85.8% in cities and 32.4% in rural areas. The municipality with the lowest degree of sewerage (0%) is the rural municipality of Ośno Lubuskie. The length of the sewerage network in relation to the length of the water supply network was 57.46% [6,7]. Wastewater management systems in Słubice district by agglomeration are shown in Fig. 5. On the territory of the Słubice district, five agglomerations have been established: Słubice (PLLU016) [23], Ośno Lubuskie (PLLU038) [24], Cybinka (PLLU043) [25], Górzyca (PLLU050) [26] and Rzepin (PLLU0270) [27]. The annual volume of wastewater discharged to the wastewater treatment plant in 2020 was 1,651dam^3. The capacity of wastewater treatment plants located in Słubice district in total is 11,257 m^3/d. Wastewater treatment plants in Słubice district in 2020 were used by 34,962 people, which is 74.5%, in the total population of the districtis; 94.1% in urban areas and 40.5% in rural areas. On the territory of Słubice district, there are 2608 non-drainage tanks for storing liquid waste and 354 domestic sewage treatment plants [6,7].

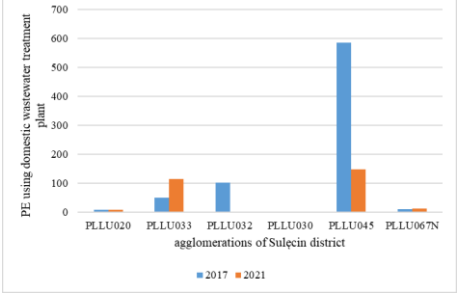
2.5. Sulęcin district

Sulęcin district is located in the central part of Lubuskie province, it covers an area of 1,178 km^2, which is 8.4% of the province's area Sulęcin district consists of 5 municipalities: 3 urban-rural municipalities: Sulęcin, Lubniewice, Torzym, and 2 rural municipalities: Słońsk, Krzeszyce. In 2020, the length of the operated water supply network in Sulęcin County was 425.7 km. There were 32431 district residents connected to the network (about 92.7% of the total district population), including 96.7% of urban residents and 89.7% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to total residential buildings, it was 83.1%, respectively 81.8% in cities and 83.7% in rural areas. The lowest degree of water supply is in the rural areas of Torzym municipality and is 76.6%. In 2020, the total household water consumption was 1,078 dam^3. The average consumption of piped water in households per capita in the district was 30.7 m^3. The highest water consumption per capita was recorded in the municipality of Sulęcin (41.2 m^3/PE), and the lowest in the rural municipality of Torzym (22.4 m^3/PE). The length of the sewerage network in Sulęcin County in 2020 was 185.7 km. There were 23248 district residents (66.4% of the total district population) connected to the sewerage system, including 88.4% of the population in urban areas and 50.7% of the rural population. On the other hand, taking into account the number of buildings connected to the sewer system in relation to total residential buildings, it was 49.2%, respectively 65.9% in cities and 41.8% in rural areas. The municipality with the lowest degree of sewerage of 30.2% is the rural municipality of Krzeszyce. The length of the sewerage network in relation to the length of the

water supply network was 43.62%. Wastewater management systems in Sulęcin district by agglomeration are shown in Fig.6. In Sulęcin district, 6 agglomerations have been designated: Sulęcin (PLLU020) [28], Lubniewice (PLLU033) [29], Torzym (PLLU032) [30], Boczów (PLLU030) [31], Słońsk (PLLU045) [32] and Wędrzyn (PLLU067N) [33].







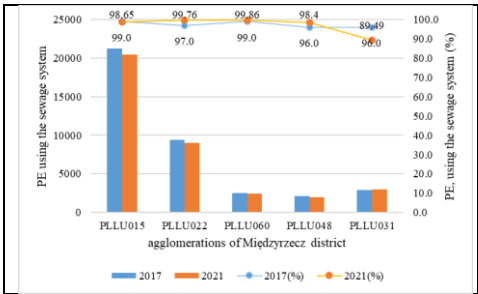
Sulęcin WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU020 B $2615m^3/d$ (14234) Postomia in km 26+200
Lubniewice WWTP type Q, m^3/d (PE)	PLLU033 B $500m^3/d$ (4500)
Torzym WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU032 B $450m^3/d$ (5500) Ilanka river in km 58+500
Boczów WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU030 B $300m^3/d$ (2400) drainage ditch R-14
Słońsk WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU045 B $600m^3/d$ (4600) drainage ditch
Wędrzyn WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU067N B $1800m^3/d$ (3420). Postomia in km 41+500

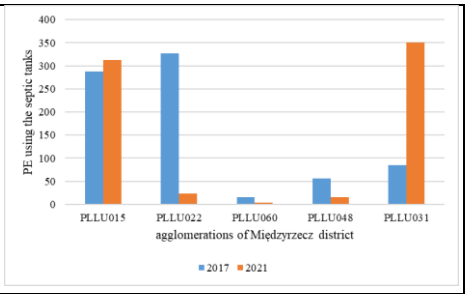
Fig.6. Wastewater systems in agglomeration of Sulęcin district

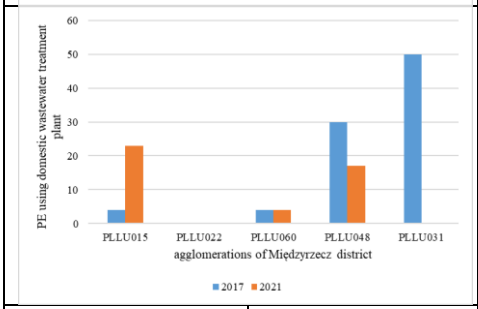
The annual volume of wastewater discharged to the wastewater treatment plant was 1,301dam^3 in 2020. The total capacity of wastewater treatment plants located in Sulęcin district is 6,425 m^3/d. There are 6 biological municipal wastewater treatment plants in the district. Wastewater treatment plants in Sulęcin district in 2020 were used by 26,481 people, or 75.7%, of the total population of the district; is 98.8% in urban areas and 59.1% in rural areas. In Sulęcin district, there are 1,932 non-drainage tanks for storing liquid waste and 601 household sewage treatment plants [6,7].

2.6. Międzyrzecz district

Międzyrzecz district is located in the central-eastern part of Lubuskie Voivodeship, covering an area of 1,388 km^2, which accounts for 9.9% of the voivodeship's area. Międzyrzecz district consists of 6 municipalities: 3 urban-rural municipalities: Międzyrzecz, Skwierzyna and Trzciel, and 3 rural municipalities: Bledzew, Przytoczna and Pszczew. In 2020, the length of the operational water supply network in the Międzyrzecz district was 423.2 km. 50891 residents of the district were connected to the network (about 89.1% of the district's total population), including 95.4% of urban residents and 82.5% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to total residential buildings, it was 82.2%, respectively 79.7% in cities and 83.5% in rural areas. The lowest degree of water supply is in the rural areas of the Trzciel municipality and amounts to 61.3%. All water intakes have water treatment stations. In 2020, total household water consumption was 1,575.6 dam^3. The average consumption of water from waterworks in households per capita of the district was 27.5 m^3. The highest water consumption per capita was recorded in the municipality of Międzyrzecz city (31.3 m^3/PE) and the lowest in the rural municipality of Trzciel (16.2 m^3/PE). The length of the sewerage network in Międzyrzecz district in 2020 was 362.4km. There were 38,563 district residents (67.5% of the total district population) connected to the sewerage network, including 89.9% of the population in urban areas and 43.7% of the rural population. On the other hand, taking into account the number of buildings connected to the sewer system in relation to total residential buildings, it was 51.7%, respectively 72.3% in cities and 41% in rural areas. The municipality with the lowest degree of sewerage of 45.3% is the rural municipality of Przytoczna. The length of the sewerage network in relation to the length of the water supply network was 85.63% [6,7]. Wastewater management systems in Międzyrzecz district by agglomeration are shown in Fig.7.Within the Międzyrzecz district, 5 agglomerations have been designated: Międzyrzecz (PLLU015) [34], Skwierzyna (PLLU022) [35], Trzciel (PLLU060) [36], Przytoczna (PLLU048) [37] and Pszczew (PLLU031) [38]. The annual volume of wastewater discharged to the wastewater treatment plant was 1650.9 dam^3 in 2020. The total capacity of wastewater treatment plants located in the Międzyrzecz district is 17,523 m^3/d. Wastewater treatment plants in the district in 2020 were used by 42,361 people (of which 62.4% used wastewater treatment plants with enhanced nutrient removal), which is 74.2%, of the total population of the district; 95.7% in urban areas and 51.3% in rural areas. There are 2,806 non-drainage tanks for storing liquid waste and 481 domestic sewage treatment plants in the Międzyrzecz district [6,7].







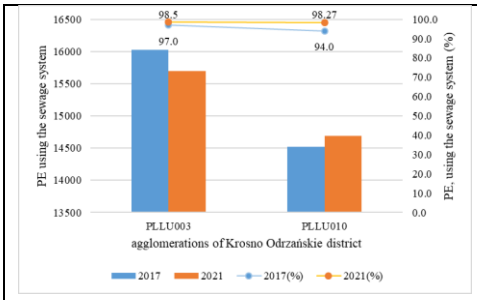
Międzyrzecz WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU015 PUB2 6000m^3/d (38000) Obra river in km 313+400
Skwierzyna WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU022 PUB2 2500 m^3/d (14585) Warta river in km 94+400
Trzciel WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU060 B 500m^3/d (4295) Obra river in km85+010
Przytoczna WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU048 B 700m^3/d (4838) drainage ditch
Pszczew WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU031 B 400m^3/d (6745) Obra river

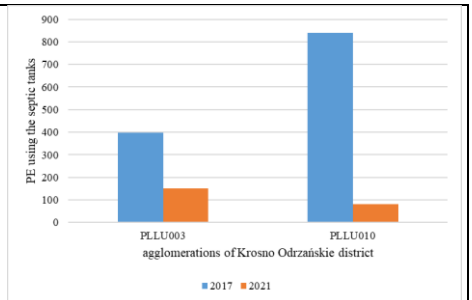
Fig.7. Wastewater systems in agglomeration of Międzyrzecz district

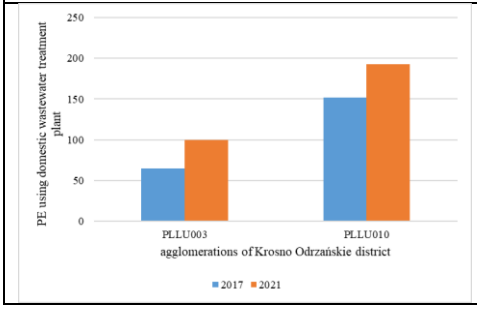
1.7. Krosno Odrzańskie district

Krosno Odrzańskie district is located in the central-eastern part of Lubuskie Voivodeship, occupies an area of 1,391 km^2, which accounts for 9.9% of the voivodeship's area. The district consists of 7 municipalities: 1 urban municipality: Gubin,1 urban-rural municipality: Krosno Odrzańskie and 5 rural municipalities: Gubin, Bobrowice, Bytnica, Dąbie and Maszewo. In 2020, the length of the operational water supply network in Krosno Odrzańskie district was 644.8 km. There were 50,487 residents of the district connected to the network (about 92.5% of the district's total population), including 94.2% of urban residents and 90.7% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to the total number of residential buildings, it was 92.2%, respectively 94% in cities and 91.2% in rural areas. The lowest degree of water supply is in the rural areas of Gubin municipality, at 85.8%. In 2020, total household water consumption was 1,664.8 dam^3. The average consumption of piped water in households per capita in the district was 30.4m^3. The highest water consumption per capita was recorded in the municipality of Bytnica (36.6 m^3/PE) and the lowest in the municipality of Maszewo (18.1 m^3/PE). The share of industry in total water consumption was

4.2%. The length of the sewerage network in the Krosno Odrzańskie district in 2020 was 226.7 km. There were 33,624 residents of the district (61.6% of the total population of the district) connected to the sewerage system, including 89.1% of the population in urban areas and 33.3% of the rural population. On the other hand, taking into account the number of buildings connected to the sewer system in relation to total residential buildings, it was 45.4%, respectively 81.1% in cities and 26.5% in rural areas. The municipality with the lowest degree of sewerage of 9.8% is the rural municipality of Gubin. The length of the sewerage network in relation to the length of the water supply network was 35.16% [6,7]. Wastewater management systems in Krosno Odrzańskie district by agglomeration are shown in Fig. 8. Within the Krosno Odrzańskie district, 2 agglomerations have been designated: Krosno Odrzańskie (PLLU010) [39] and Gubin (PLLU003) [40].







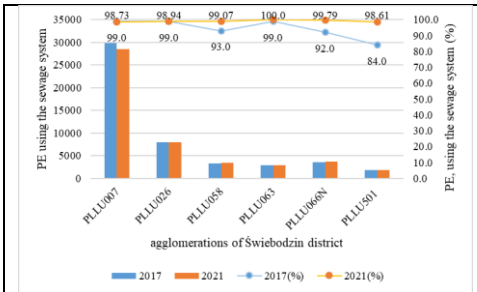
Krosno Odrzańskie WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU010 PUB2 2200m^3/d (16636) Odra river in km 512+900
Gubin WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU003 PUB2 12000m^3/d (90000) Nysa Łużycka river in km 13+400

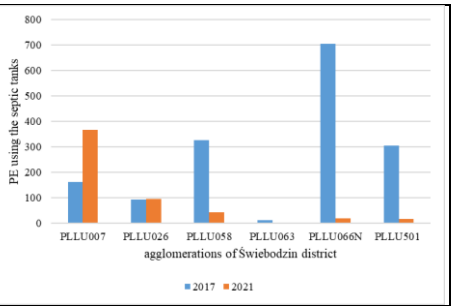
Fig. 8. Wastewater systems in agglomeration of Krosno Odrzańskie district

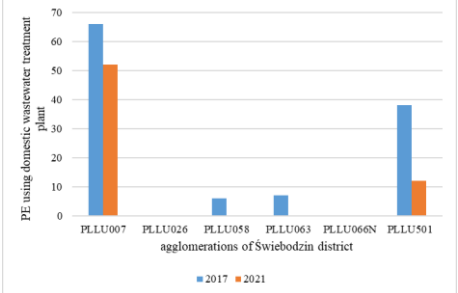
The annual volume of wastewater discharged to the wastewater treatment plant was 1,235 dam^3 in 2020. The total capacity of wastewater treatment plants located in Krosno district is 19,900 m^3/d. Wastewater treatment plants in Krosno Odrzańskie district in 2020 were used by 35,516 people (of which 55.9% used wastewater treatment plants with enhanced nutrient removal), which is 65.1%, in the total population of the district; is 94.2% in urban areas and 35.1% in rural areas [6,7].

2.8. Świebodzin district

Świebodzin district is located in the central-eastern part of Lubuskie Voivodeship and covers an area of 937.4 km^2, which is 6.7% of the voivodeship area. Świebodzin district is made up of 6 municipalities: 2 urban-rural municipalities: Świebodzin and Zbąszynek, and 4 rural municipalities: Lubrza, Łagów, Skąpe and Szczaniec. According to data from 2020, the length of the operational water supply network in Świebodzin district was 362.4 km. There were 53,325 district residents connected to the network (about 94.2% of the total district population), including 99% of urban residents and 89.8% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to total residential buildings, it was 87.1%, respectively 83.9% in cities and 88.4% in rural areas.







Świebodzin Szczaniec WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU007 PLLU501 PUB2 6700m^3/d (39600) Struga Świebodzińska in km 13+200
Zbąszynek WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU026 B 1300 m^3/d (9062) drainage ditch
Łagów WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU058 B 900m^3/d (9042) Łagowa river in km 4+152
Skąpe WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU031 B 1200m^3/d (6070) Odra river in km11+300
Lubrza WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU048 B 980m^3/d (3335) drainage ditch

Fig.9. Wastewater systems in agglomeration of Świebodzin district

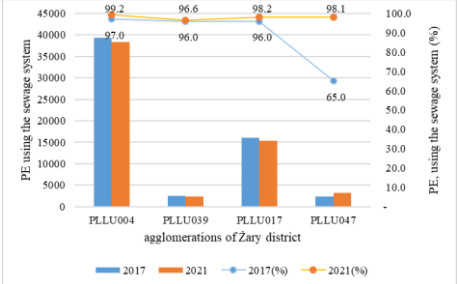
The lowest degree of water supply is in the rural areas of Świebodzin municipality, at 77.8%. In 2020, total household water consumption was 1,687.1 dam^3. The average consumption of piped water in households per capita in the district was 30.3m3. The highest water consumption per capita was recorded in the municipality of Zbąszynek town (34.6 m^3/PE) and the lowest in the municipality of Łagów (23.1m^3/PE). The length of the sewerage network in

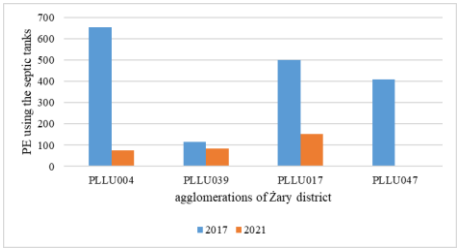
Świebodzin district in 2020 was 435.5 km. 47,243 residents of the district (85.1% of the district's total population) were connected to the sewerage system, including 97.4% of the urban population and 73.8% of the rural population. On the other hand, taking into account the number of buildings connected to the sewer system in relation to total residential buildings, it was 77.7%, respectively 80.5% in cities and 76.5% in the countryside. The municipality with the lowest degree of sewerage of 48.9% is Szczaniec. The length of the sewerage network in relation to the length of the water supply network was 120.17% [6,7]. Wastewater management systems in Świebodzin district by agglomeration are shown in Fig.9. On the territory of Świebodzin district, 6 agglomerations were designated: Świebodzin (PLLU007) [41], Zbąszynek (PLLU026) [42], Łagów (PLLU058) [43], Lubrza (PLLU063) [44], Skąpe (PLLU066N) [45] and Szczaniec (PLLU501) [46]. The annual volume of wastewater discharged to the wastewater treatment plant was 1950dam^3 in 2020. The total capacity of wastewater treatment plants located in Świebodzin district is 10,560 m^3/d. Wastewater treatment plants in the Gorzow district in 2020 were used by 51,065 people (of which 61.1% used wastewater treatment plants with enhanced nutrient removal), which is 92%, of the total population of the district; 99.7% in urban areas and 84.9% in rural areas. In Świebodzin district, there are 900 non-drainage tanks for storing liquid waste and 207 domestic sewage treatment plants.

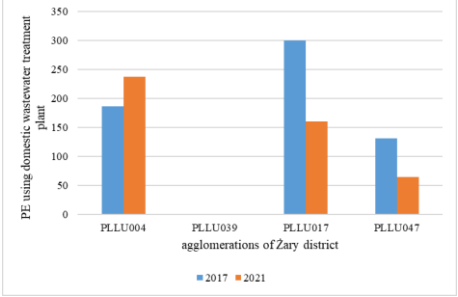
2.9 Żary district

Żary district is located in the southwestern part of Lubuskie Voivodeship, occupies an area of 1,392.8 km^2, which is 10.0% of the voivodeship's area Żary district consists of 10 municipalities: 2 urban municipalities: Żary, Łęknica, 2 urban-rural municipalities: Lubsko, Jasień and 6 rural municipalities: Brody, Tuplice, Trzebiel, Lipinki Łużyckie, Żary, Przewóz. In 2020, the length of the operated water supply network in the Żary district was 937.8 km. To the network were connected 89184 residents of the district (about 93.5% of the total population of the district), including 96.6% of urban residents and 88.8% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to the total number of residential buildings, it was 88.2%, respectively 86.6% in cities and 89.4% in rural areas. The lowest degree of water supply is in the rural areas of the municipality of Trzebiel and is 81.6%. In 2020, the total household water consumption was 3,002.4 dam^3. The average consumption of piped water in households per capita of the district was 31.3 m^3. The highest water consumption per capita was recorded in the municipality of Tuplice (39.2 m^3/PE) and the lowest in the municipality of Brody (24.6 m^3/PE). The length of the sewerage network on the territory of Żary district in 2020 was 342.8 km. There were 58,393 residents of the district connected to the sewerage system (61.2% of the total population of

the district), including 89.9% of the population in urban areas and 17.9% of the rural population. On the other hand, taking into account the number of buildings connected to the sewer system in relation to the total number of residential buildings, it was 42.7%, 76.8% in cities and 17.3% in rural areas, respectively. The municipality with the lowest degree of sewerage of 0% is the rural municipality of Trzebiel. The length of the sewerage network in relation to the length of the water supply network was 36.55% [6,7]. Wastewater management systems in Żary district by agglomeration are shown in Fig.10. In Żary district, 4 agglomerations have been designated: Żary (PLLU004) [47], Łęknica (PLLU039) [48], Lubsko (PLLU017) [49] and Jasień (PLLU047) [50].







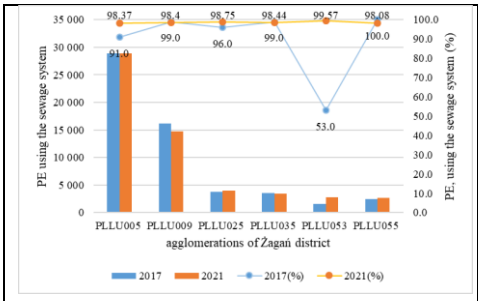
Żary WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU004 PUB2 8000m^3/d (41954) Złota Struga in km 12+750
Łęknica WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU039 B 230m^3/d (3967) Nysa Łużycka in km 79+605
Lubsko WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU017 PUB2 4200 m^3/d (21708) Lubsza river
Jasień WWTP type Q, m3/d (PE) Wastewater receiver	PLLU047 B 653 m^3/d (4948) Lubsza river in km 35+595

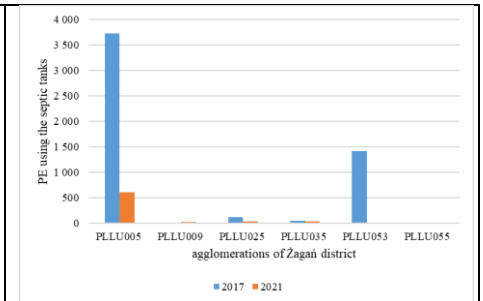
Fig.10. Wastewater systems in agglomeration of Żary district

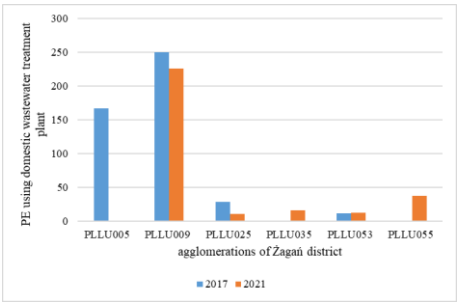
The annual volume of wastewater discharged to the wastewater treatment plant was 2,225.9 dam^3 in 2020. The total capacity of wastewater treatment plants located in Żary district is 28,170 m^3/d. Wastewater treatment plants in Żary district in 2020 were used by 65,779 people (of which 41.2% used wastewater treatment plants with enhanced nutrient removal), which is 68.9%, of the total population of the county; is 93.7% in urban areas and 31.6% in rural areas. There are 4,885 non-drainage tanks for storing liquid waste and 1,444 domestic sewage treatment plants in the Żary district [6,7].

2.10. Żagań district

Żagań district is located in the southern part of Lubuskie Province and covers an area of 1,132 km^2, which is 8.1% of the province's area The Żagań district is made up of 9 municipalities: 2 urban municipalities: Gozdnica and Żagań, 3 urban-rural municipalities: Ilowa, Małomice and Szprotawa, and 4 rural municipalities: Brzeźnica, Niegosławice, Wymiarki and Żagań. In 2020, the length of the operational water supply network in Żagań district was 821 km. There were 75202 district residents connected to the network (about 96.2% of the district's total population), including 99.2% of urban residents and 91.7% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to total residential buildings, it was 93.6%, respectively 97.8% in cities and 90.1% in rural areas. The lowest degree of water supply of 77.7% is in the rural areas of Ilowa municipality. In 2020, total household water consumption was 2,287.8 dam^3. The average consumption of piped water in households per capita of the district was 29.1 m^3. The highest water consumption per capita was recorded in the municipality of Ilowa (260.5 m^3/PE) and the lowest in the municipality of Niegosławice (27.1 m^3/PE). The length of the sewerage network in the Żagań district in 2020 was 423.2 km. There were 54,529 residents of the district connected to the sewerage network (69.8% of the total population of the district), including 86.1% of the population in urban areas and 45.1% of the rural population. On the other hand, taking into account the number of buildings connected to the sewer system in relation to total residential buildings, it was 55.8%, respectively 85.7% in cities and 30.7% in rural areas. Municipalities with the lowest degree of sewerage include the rural municipalities of Ilowa 3.1%, Brzeźnica 10.8% and Wymiarki 11.4%. The length of the sewerage network in relation to the length of the water supply network was 51.55% [6,7]. Wastewater management systems in Żagań district by agglomeration are shown in Fig.11. 6 agglomerations were designated in the Żagań district: Żagań (PLLU005) [51], Szprotawa (PLLU009) [52], Iłowa (PLLU025) [53], Małomice (PLLU035) [54], Gozdnica (PLLU053) [55] and Niegosławice (PLLU055) [56]. The annual volume of wastewater discharged to the wastewater treatment plant was 1,890.8 dam^3 in 2020. The total capacity of wastewater treatment plants located in the Żagań district is 21,054 m^3/d. Wastewater treatment plants in Żagań County in 2020 were used by 57,173 people (of which 45.1% used wastewater treatment plants with enhanced nutrient removal), which is 73.2%, of the total population of the county. The figure is 93.6% in urban areas and 42.1% in rural areas. On the territory of Żagań district, there are 3,372 non-drainage tanks for storing liquid waste and 1206 domestic sewage treatment plants [6,7].







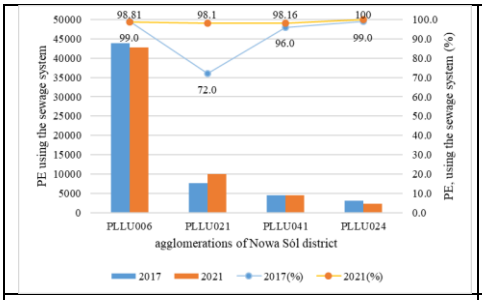
		Żagań WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU005 PUB2 15000m^3/d (75000) Bóbr river in km 70+670
		Szprotawa WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU009 PUB2 2500 m^3/d (37500) Bóbr river in km 102+306
		Iłowa WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU025 B 1500m^3/d (10000) Czerna river
		Gozdnica WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU053 B 576m^3/d (3600) Czernica river in km 0+300
Niegosławice WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU055 B (in Niegosławice) 450 m^3/d Niegosławice river in km 0+500	Małomice WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU035 B 519m^3/d (4500) Młynówka in km 0+530
WWTP type Q, m^3/d (PE) Wastewater receiver	B (in Mycielin) 300 m^3/d drainage ditch		

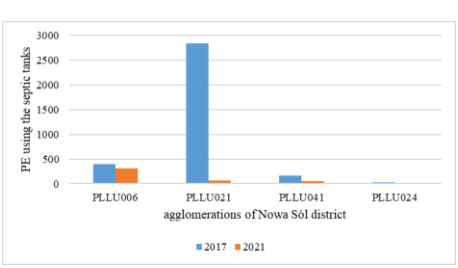
Fig.11. Wastewater systems in agglomeration of Żagań district

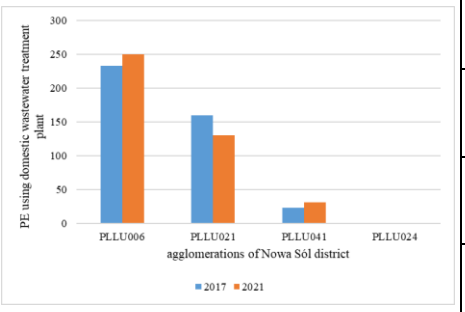
2.11. Nowa Sól district

Nowa Sól district is located in the southern part of Lubuskie province, covering an area of 771 km^2, which is 5.5% of the province's area. Nowa Sól district is made up of 8 municipalities: 1 urban municipality: Nowa Sól, 4 urban-rural municipalities: Bytom Odrzański, Kożuchów, Nowe Miasteczko, Otyń and 3 rural municipalities: Kolsko, Nowa Sól, Siedlisko. In 2020, the length of the operational water supply network in Nowa Sól district was 613.8 km. There were 81,823 district residents connected to the network (about 95.4% of the total district population), including 99% of urban residents and 88.7% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to total residential buildings, it was 91.4%, respectively 97.6% in cities and 86.3% in rural areas. The lowest degree of water supply is in the rural areas of Kolsko municipality and is 63%. In 2020, the total household water consumption was 2587.1 dam^3. The average

consumption of piped water in households per capita of the district was 30.1 m^3. The highest water consumption per capita was recorded in the urban municipality of Kożuchów (41.2 m^3/PE) and the lowest in the rural municipality of Kolsko (21.6 m^3/PE). The length of the sewerage network in the Nowa Sól district in 2020 was 323.6 km. 63,986 residents of the district (74.6% of the total population of the district) were connected to the sewerage network, including 96.2% of the population in urban areas and 33.8% of the rural population. On the other hand, taking into account the number of buildings connected to the sewer system in relation to total residential buildings, it was 54.7%, respectively 87.1% in cities and 28% in rural areas. The municipality with the lowest degree of sewerage of 3.1% is the rural municipality of Kożuchów. The length of the sewerage network in relation to the length of the water supply network was 52.72% [6,7]. Wastewater management systems in Nowa Sól district by agglomeration are shown in Fig.12. There are 4 agglomerations designated in Nowa Sól district: Nowa Sol (PLLU006) [57], Kożuchów (PLLU021) [58], Bytom Odrzański (PLLU041) [59] and Nowe Miasteczko (PLLU024) [60].







Nowa Sól WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU006 PUB2 8175m^3/d (71050) Czarna Struga in km 1+500
Kożuchów WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU021 PUB2 1625m^3/d (11750) Kożuszna canal in km 8+930
Bytom Odrzański WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU041 B 600m^3/d (10800) drainage ditch
Nowe Miasteczko WWTP type Q, m3/d (PE) Wastewater receiver	PLLU024 B 652 m^3/d (3818) Biała Woda river in km 9+744

Fig.12. Wastewater systems in agglomeration of Nowa Sól district

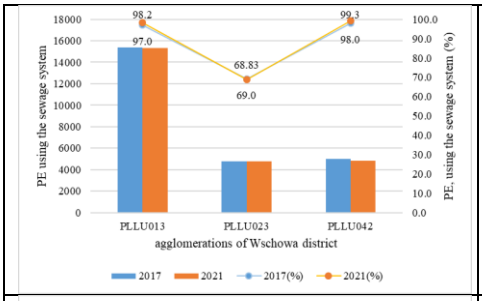
The annual volume of wastewater discharged to the wastewater treatment plant was 2,228 dam^3 in 2020. The total capacity of wastewater treatment plants located in the Nowa Sól district is 20,178 m^3/d. Wastewater treatment plants in Nowa Sól district in 2020 were used by 60,462 people (of which 58.9% used wastewater

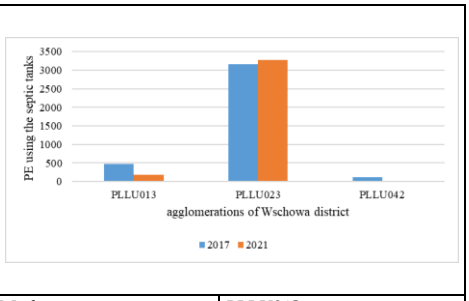
treatment plants with enhanced nutrient removal), which is 70.5%, in the total population of the district; 92.3% in urban areas and 29.3% in rural areas. There are 5,322 non-drainage tanks for storing liquid waste and 786 domestic sewage treatment plants in the Nowa Sól district [6,7].

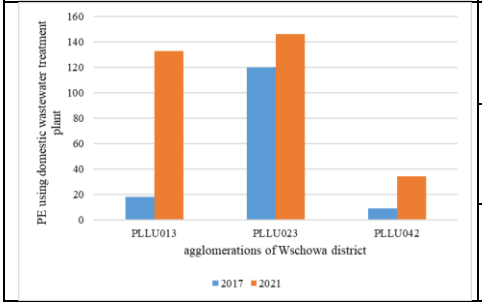
2.12. Wschowa district

Wschowa district is located in the southeastern part of Lubuskie Voivodeship, covering an area of 624 km^2, or 4.5% of the voivodeship's area. Wschowski district is made up of 3 urban-rural municipalities: Sława, Wschowa and Szlichtyngowa. In 2020, the length of the operational water supply network in Wschowa district was 354.9 km. 36,065 residents of the district (about 93.4% of the district's total population) were connected to the network, including 96.9% of urban residents and 90% of rural residents. On the other hand, taking into account the number of buildings connected to the water supply system in relation to total residential buildings, it was 85.6%, 76.1% in cities and 91.6% in rural areas, respectively. The lowest degree of water supply is in the rural areas of Sława municipality, at 83%. In 2020, total household water consumption was 1,414.3 dam^3. The average consumption of piped water in households per capita in the district was 36.5 m^3. The highest water consumption per capita was recorded in the rural municipality of Wschowa (52.3 m^3/PE) and the lowest in the rural municipality of Sława (18.8 m^3/PE). The length of the sewerage network in Wschowa district in 2020 was 195.7 km. 26,760 residents of the district (69.3% of the district's total population) were connected to the sewerage network, including 94.6% of the population in cities and 44.2% of the rural population. On the other hand, taking into account the number of buildings connected to the sewer system in relation to the total number of residential buildings, it was 46.9%, respectively 78.2% in cities and 27.1% in the countryside. The municipality with the lowest degree of sewerage of 21.9% is the rural municipality of Sława. The length of the sewerage network in relation to the length of the water supply network was 55.14% [6,7]. Wschowa district sewage management systems by agglomeration are shown in Fig.13. three agglomerations have been designated in Wschowa district: Wschowa (PLLU013) [61], Sława (PLLU023) [62] and Szlichtyngowa (PLLU042) [63]. The annual volume of wastewater discharged to the wastewater treatment plant was in 2020. 1317 dam^3. The total capacity of wastewater treatment plants located in Wschowa district is 7,575 m^3/d. Wastewater treatment plants in Wschowa district in 2020 were used by 24,131 people (of which 38.4% used wastewater treatment plants with enhanced nutrient removal), accounting for 62.5%, in the total population of the district, 96.3% in urban areas and with 28.9% in rural areas. In the Wschowa district, there are 3059

non-drainage tanks for storing liquid waste and 137 domestic wastewater treatment plants [6,7].







Wschowa WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU013 PUB2 6700m^3/d (43750) drainage ditch
Sława WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU023 PUB2 3000m^3/d (45000) drainage Moczar
Szlichtyngowa WWTP type Q, m^3/d (PE) Wastewater receiver	PLLU042 PUB2 985m^3/d (5150) drainage ditch

Fig.13. Wastewater systems in agglomeration of Wschowa district

3. SUMMARY

An analysis of equipment in collective water supply systems showed that the lowest percent of residents connected to water system supply was in Międzyrzecz district, at 89.1%. On the other hand, the highest degree was in Zielona Gora district (96.2%), and was higher than in the entire Lubuskie province and in Poland. It was also shown that in rural areas there is a smaller part of people with access to water system supply than in cities. The lowest was in the district of Międzyrzecz at 82.5%, and the highest in the district of Zielona Gora at 96.2%. In the cities, the rate was between 94.2 and 99.2%. In the case of connecting buildings to water system supply, the lowest percentage was in Międzyrzecz district 82.2%, and the highest in Żagań district 93.6%. In rural areas, the water system supply was connected from 83.5% of the buildings in Międzyrzecz district to 97.8% in Żagań district. In urban areas, the lowest rate was in Wschowa district 76.1%, and the highest in Zielona Góra 91.8% (Fig. 14).

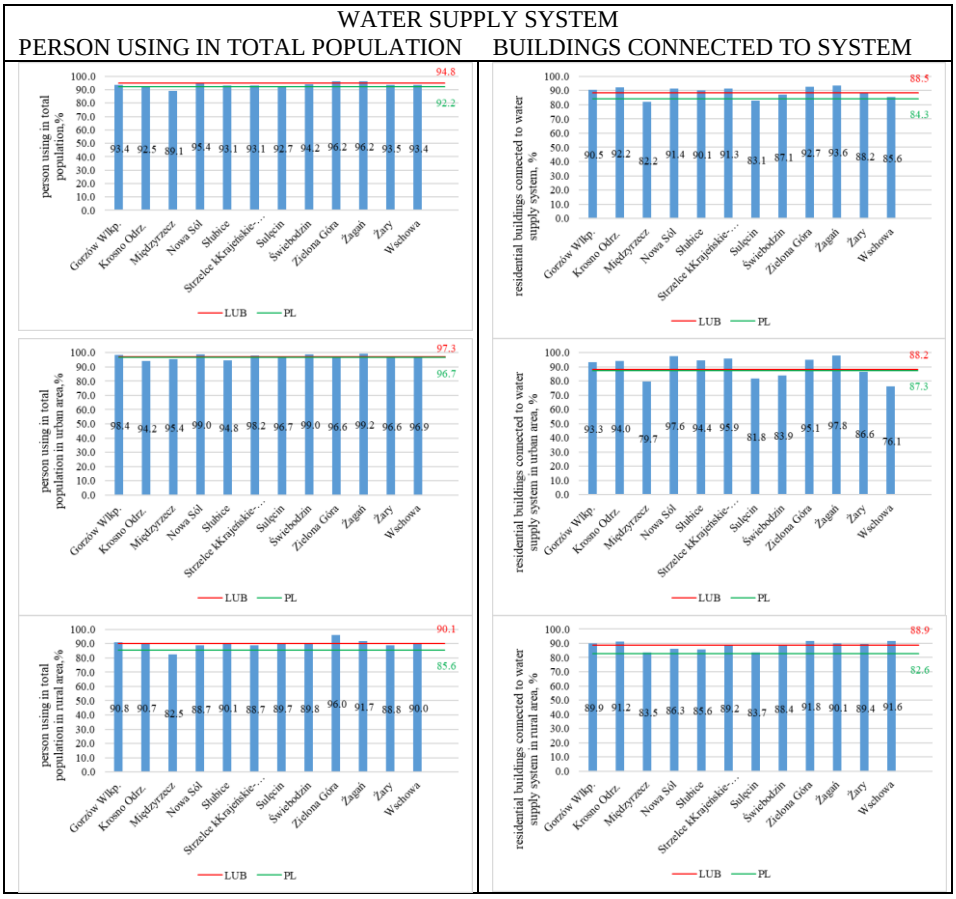


Fig.14. Persons and residentail buildings connected to water supply system in districts of Lubuskie Voivodeship

An analysis of equipment in collective sewage disposal systems (Fig.15) showed that the residents of Strzelce Krajeńskie-Drezdenko district have the least access to sewage systems - 55.7%, and the highest in Świebodzin - 85.1% (above the average for Lubuskie Voivodeship and Poland). In the remaining districts, the values were lower than the provincial and national averages. Disparities in access to sewerage for rural residents are definitely greater. Only 17.9% of rural residents in Żarski district have access to sewerage (17.3% of buildings), while in Świebodzin district it is 73.8% (76.5% of buildigs). In rural areas, many districts do not reach the average level for the Lubuskie Voivodeship, or Poland.

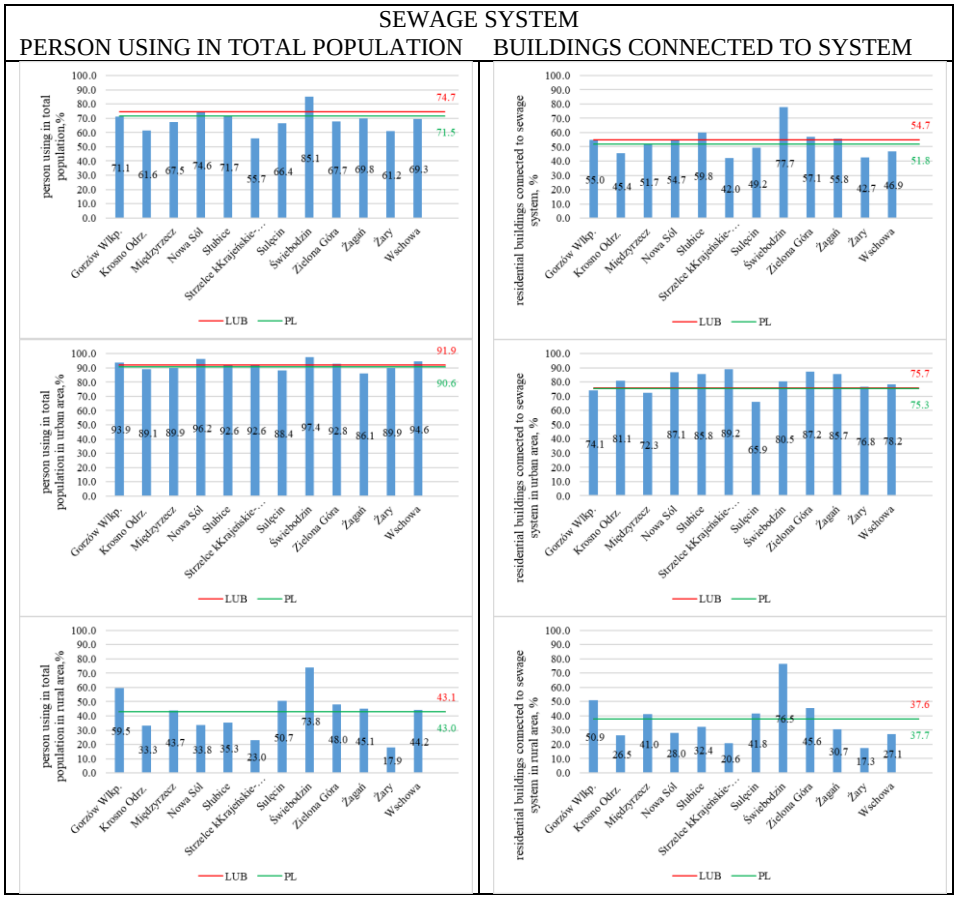


Fig.15. Persons and residentail buildings connected to sewage system in districts of Lubuskie Voivodeship

An analysis of wastewater treatment systems in the districts of Lubuskie Voivodeship (Fig.16) showed that in Świebodzin district population connected to municipal WWTP is the highest at 92.1% and exceeds the average values for Lubuskie Voivodeship and Poland. In the cities of all districts of the province, more than 92% of the population uses central wastewater treatment plants, and in Świebodzin the rate is 99.7%. In rural areas, the less population uses central wastewater treatment systems. In the district of Wschowa it is 28.4%. More than half of the districts have a lower than the average for Lubuskie Voivodeship and Poland. On the other hand, in Świebodzin district 85% of rural residents use central wastewater treatment systems.

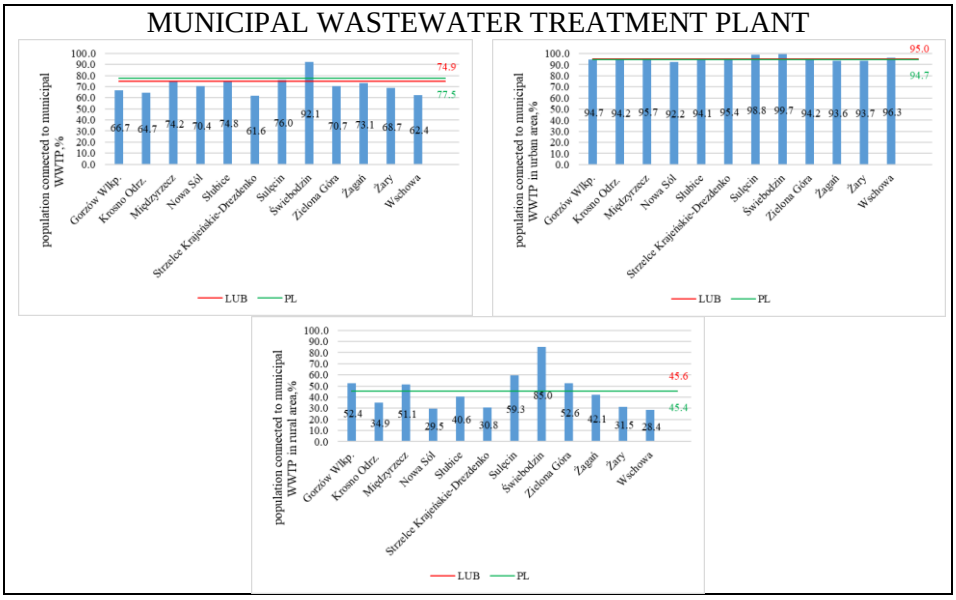


Fig.16. Population connected to municipal wastewater treatment plant in district of Lubuskie Voivodeship

4. CONCLUSION

The districts of Lubuskie Voivodeship vary in the degree to which areas are connected to the water supply and sewerage systems. In the case of access to the water supply system, the disparity is small and in most districts is close to the average level for Poland. Definitely greater disparities can be seen in access to sewerage and collective sewage treatment systems, especially in rural areas. In this case, half of the districts of Lubuskie Voivodeship do not reach the average levels for Lubuskie Voivodeship and Poland. Actions carried out within the framework of KPOŚK are improving the situation, as shown by the analysis of data from 2017 and 2021. In Lubuskie Voivodeship, many investments are planned to improve wastewater management until 2027.

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[Resolution no. XXX/276/2020 of Nowogród Bobrzański Town Council of December 3, 2020 on designation of agglomeration Nowogród Bobrzański]
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41. Uchwała Nr XXIX/392/2021 Rady Miejskiej W Świebodzinie z dnia 26 marca 2021 r. w sprawie wyznaczenia obszaru i granic aglomeracji Świebodzin [Resolution No. XXIX/392/2021 of the Municipal Council in Świebodzin of March 26, 2021 on designation of the area and boundaries of the Świebodzin agglomeration]
42. Uchwała Nr XXVI/91/2020 Rady Miejskiej W Zbąszynku z dnia 28 grudnia 2020 r. w sprawie wyznaczenia obszaru i granic aglomeracji Zbąszynek [Resolution No. XXVI/91/2020 of the Municipal Council in Zbąszynek of December 28, 2020 on the designation of the area and boundaries of the Zbąszynek agglomeration]
43. Uchwała Nr XIV.110.2020 Rady Gminy Łagów z dnia 21 lutego 2020 r. w sprawie wyznaczenia aglomeracji Łagów [Resolution No. XIV.110.2020 of the Łagów Municipality Council of February 21, 2020 on the designation of the Łagów agglomeration]

44. Uchwała nr XV/131/20 Rady Gminy Lubrza z dnia 28 kwietnia 2020 r. w sprawie wyznaczenia aglomeracji Lubrza [Resolution No. XV/131/20 of the Lubrza Municipality Council of April 28, 2020 on the designation of the Lubrza agglomeration]
45. Uchwała Nr XXV/212/2020 Rady Gminy Skąpe z dnia 27 listopada 2020 r. w sprawie wyznaczenia obszaru i granic aglomeracji Skąpe [Resolution No. XXV/212/2020 of the Skąpe Municipal Council of November 27, 2020 on the designation of the area and boundaries of the Skąpe agglomeration]
46. Uchwała Nr XXIX/76/21 Rady Gminy Szczaniec z dnia 25 marca 2021 r. w sprawie wyznaczenia obszaru i granic Aglomeracji Szczaniec [Resolution No. XXIX/76/21 of the Szczaniec Municipal Council of March 25, 2021 on the designation of the area and boundaries of the Szczaniec agglomeration]
47. Uchwała Nr XXIX/35/21 Rady Miejskiej W Żarach z dnia 28 maja 2021 r. w sprawie wyznaczenia obszaru i granic aglomeracji Żary [Resolution No. XXIX/35/21 of the Municipal Council in Żary of May 28, 2021 on the designation of the area and boundaries of the Żary agglomeration]
48. Uchwała Nr XXIV.152.2020 Rady Miejskiej W Łęknicy z dnia 30 grudnia 2020 r. w sprawie wyznaczenia obszaru i granic aglomeracji Łęknica [Resolution No. XXIV.152.2020 of the Municipal Council in Łęknica of December 30, 2020 on the determination of the area and boundaries of the Łęknica agglomeration]
49. Uchwała Nr XXVI/202/20 Rady Miejskiej W Lubsku z dnia 22 grudnia 2020 r. w sprawie wyznaczenia obszaru i granic aglomeracji Lubsko [Resolution No. XXVI/202/20 of the Lubsko City Council of December 22, 2020 on the designation of the area and boundaries of the Lubsko agglomeration]
50. Uchwała Nr XXI/154/2020 Rady Miejskiej W Jasieniu z dnia 29 grudnia 2020 r. w sprawie wyznaczenia obszaru i granic aglomeracji Jasień [Resolution No. XXI/154/2020 of the Municipal Council of Jasień dated December 29, 2020 on the designation of the area and boundaries of the Jasień agglomeration]
51. Uchwała Nr XXXIV/170/2021 Rady Miasta Żagań z dnia 27 sierpnia 2021 r. w sprawie wyznaczenia obszaru i granic aglomeracji Żagań [Resolution No. XXXIV/170/2021 of the Żagań City Council of August 27, 2021 on the designation of the area and boundaries of the Żagań agglomeration]
52. Uchwała Nr XXVI/191/2020 Rady Miejskiej W Szprotawie z dnia 11 grudnia 2020 r. w sprawie wyznaczenia obszaru i granic aglomeracji Szprotawa [Resolution No. XXVI/191/2020 of the Municipal Council in Szprotawa of December 11, 2020 on the designation of the area and boundaries of the Szprotawa agglomeration]
53. Uchwała Nr 202/8/XXVI/20 Rady Miejskiej W Iłowej z dnia 9 grudnia 2020 r. w sprawie wyznaczenia aglomeracji Iłowa [Resolution No. 202/8/XXVI/20 of the Iłowa City Council of December 9, 2020 on the designation of the Iłowa agglomeration]
54. Uchwała Nr XXV/146/2020 Rady Miejskiej W Małomicach z dnia 17 grudnia 2020 r. w sprawie wyznaczenia obszaru i granic aglomeracji Małomice [Resolution No. XXV/146/2020 of the Małomice City Council of December 17, 2020 on the designation of the area and boundaries of the Małomice agglomeration]
55. Uchwała Nr XXII/128/20 Rady Miasta Gozdnica z dnia 10 grudnia 2020 r. w sprawie wyznaczenia aglomeracji Gozdnica [Resolution No. XXII/128/20 of the Gozdnica

City Council of December 10, 2020 on the designation of the Gozdnica agglomeration]
56. Uchwała Nr XXV.165.2020 Rady Gminy Niegosławice z dnia 28 grudnia 2020 r. w sprawie wyznaczenia obszaru i granic aglomeracji gminy Niegosławice [Resolution No. XXV.165.2020 of the Niegoslawice Municipality Council of December 28, 2020 on the determination of the area and boundaries of the agglomeration of the Niegoslawice Municipality].
57. Uchwała Nr XXXV/295/20 Rady Miejskiej W Nowej Soli z dnia 3 grudnia 2020 r. w sprawie wyznaczenia obszaru i granic aglomeracji Nowa Sól [Resolution No. XXXV/295/20 of the Municipal Council of Nowa Sól dated December 3, 2020 on the designation of the area and boundaries of the Nowa Sól agglomeration]
58. Uchwała Nr XXVIII/241/20 Rady Miejskiej W Kożuchowie z dnia 26 listopada 2020 r. w sprawie wyznaczenia aglomeracji Kożuchów [Resolution No. XXVIII/241/20 of the City Council of Kożuchów dated November 26, 2020 on the designation of the Kożuchów agglomeration]
59. Uchwała Nr XIV/111/2020 Rady Miejskiej W Bytomiu Odrzańskim z dnia 11 grudnia 2020 r. w sprawie wyznaczenia obszaru i granic aglomeracji Bytom Odrzański [Resolution No. XIV/111/2020 of the Municipal Council in Bytom Odrzański of December 11, 2020 on the designation of the area and boundaries of the Bytom Odrzański agglomeration]
60. Uchwała Nr XXV/160/2020 Rady Miejskiej W Nowym Miasteczku z dnia 30 grudnia 2020 r.w sprawie wyznaczenia aglomeracji Nowe Miasteczko [Resolution No. XXV/160/2020 of the Municipal Council in Nowe Miasteczko dated December 30, 2020.on designation of the Nowe Miasteczko agglomeration]
61. Uchwała Nr XXIII/219/2020 Rady Miejskiej We Wschowie z dnia 29 grudnia 2020 r. w sprawie wyznaczenia obszaru i granic aglomeracji Wschowa [Resolution No. XXIII/219/2020 of the Wschowa City Council of December 29, 2020 on the designation of the area and boundaries of the Wschowa agglomeration]
62. Uchwała Nr XXVII/213/20 Rady Miejskiej W Sławie z dnia 26 listopada 2020 r. w sprawie wyznaczenia obszaru i granicy aglomeracji Sława [Resolution No. XXVII /213/20 of the Municipal Council of Sława of November 26, 2020 on the designation of the area and boundary of the Sława agglomeration]
63. Uchwała Nr XXI/170/20 Rady Miejskiej Szlichtyngowa z dnia 30 grudnia 2020 r. w sprawie wyznaczenia aglomeracji Szlichtyngowa [Resolution No. XXI/170/20 of the Szlichtyngowa Town Council of December 30, 2020 on the designation of the Szlichtyngowa agglomeration]

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