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TECHNICAL INFRASTRUCTURE OF RURAL MUNICIPALITY OF NOWA SÓL IN THE LIGHT OF SUSTAINABLE DEVELOPMENT

S u m m a r y

Sustainable development is synonymous with the coexistence of man and the world around him on equal rights. The progressing urbanization often leads to depletion of environmental resources and puts man above natural environment.
The purpose of this paper is to analyse current situation and possibilities of development of technical infrastructure of rural municipality of Nowa Sól, the Province of Lubuskie, in the light of sustainable development.

Key words: technical infrastructure, sustainable development, rural municipality

SUSTAINABLE DEVELOPMENT YESTERDAY AND TODAY

The concept of sustainable development is related to civilization development of humanity. It has its roots in forestry. It was first used by Hans Carl von Carlowitz, who lived at the turn of the 17th and 18th century. He used this term to define the type of forest management where only as much timber can be harvested as it is enough to ensure the reproducibility of forest resources [Bukowski 2009].

Industrial civilization made the society believe that growing economic development is less and less dependent on the environment. This view was not re-evaluated until the beginnings of global ecological crisis. It was proved that the

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twentieth-century population and economic growth that exploited natural resources may disturb natural foundations of existence and development of humanity. Under the influence of global ecological threats in the last decades, social awareness has been evidently redefined.

In the 1970's, information on sustainable development appeared in the United Nations documents. According to them, the society pursuing this idea "recognizes the supremacy of ecological requirements that cannot be disturbed by the growth of civilization and cultural and economic development, is capable of managing its development in order to sustain homeostasis and symbiosis with nature, respects economical production, consumption and the use of waste, and takes care of future consequences of actions undertaken, including the needs and health of future generations" [Fiedor 2002].

The idea of sustainable development was developed and adopted at international level in the report of the World Commission for the Environment and Development entitled "Our Common Future" published in 1987 by the United Nations [UNESCO 2017].

According to this report, the most important elements of sustainable development include:

- change in the quality of economic growth,
- maintaining an adequate level of human population,
- protection and possibly enlargement of natural resources base,
- reorientation of technological processes and management methods,
- integral combination of economics and ecology in business decision making process,
- providing employment, food, water supply and sanitary facilities.

The UN Declaration, adopted at the Earth Summit in Rio de Janeiro in 1992, on Environment and Development, also known as Agenda 21, is of great importance for popularizing the idea of sustainable development. This Agenda is aimed at ensuring that the ongoing development is balanced in environmental, economic, spatial, social, institutional and political terms. At the management levels (municipality, district), the Agenda 21 should be interpreted as a process of managing sustainable development, meaning that local community participates in making the most important decisions through partnership structures [Papuziński (ed.) 2005].

In 2002, the World Summit on Sustainable Development, convened by the United Nations, took place. The Johannesburg Declaration on Sustainable Development was adopted at this Summit. The following priorities were identified in the Declaration: capital harmonization, intergenerational justice, cooperation for environmental protection and natural resources management.

Sustainable development is currently understood as a process that depends on many factors and is focused on ecological, economic and social balance. This concept consists of three synonymous elements:

- protection of natural environment understood primarily as nature ability to assimilate pollution, rational management of renewable energy resources and limitation of use of non-renewable resources to the necessary minimum,
- stable economic development understood as an increase in the quality of life (through the stability of employment and prices, macroeconomic balance and international exchange),
- fair share of life chances (including individuals, generations and neighbouring lands).

In the European Union, the binding document on sustainable development is the Communication from the Commission to the European Parliament, the Council of Europe and the Economic and Social Committee of 21 February 2002 "Towards a Global Partnership for Sustainable Development" [COM (2002) 82]. In Poland, the key documents in this matter include the Constitution [1997] and the Strategy for Sustainable Development of Poland up to the year 2025 [1999].

SPATIAL PLANNING IN VIEW OF ENVIRONMENTAL ENGINEERING INVESTMENTS

Spatial planning in Poland is based on three levels: national, regional (province) and local (cities or municipalities). The planning system is based on the cohesion between development strategies of central and local administration and the adopted plans. The basic legal act regulating the issues of spatial policy in Poland is the Act on Spatial Planning and Development of March 27, 2003 [Journal of Laws of 2018, item 1945].

The framework for projects execution are established at local level (municipalities, cities), because spatial planning system in Poland is grass-roots. Local government has the right to decide on the forms of municipal spatial development, having regard to the requirements listed in higher-level plans and supra-local public-purpose investments. Basic elements of spatial planning include: land-use planning and local zoning plans [Januchta-Szostak 2014].

Local plans and zoning permits are essential from the point of view of an individual investor, but they increase in importance when it comes to public purpose investments, i.e. actions of local (municipal), supra-local (district, province) and national nature (including international and supra-regional investments), constituting the fulfilment of public proposes referred to in the Act on Real Estate Management [Journal of Laws of 2018, item 2204]. Public nature of these actions does not depend on their subject or the source of their financing. Public purposes within the meaning of the Act include:

- separation of land for public roads and waterways, construction and maintenance of these roads, facilities and public transport objects, including airports and air traffic security devices, public communications devices and signalling system,
- construction and maintenance of drainage ducts, pipes and devices used for the transmission of liquids, steam, gases and electricity, as well as other facilities and devices necessary in order to use these ducts and devices,
- construction and maintenance of public facilities used for water supply, storage, transfer and treatment of sewage and waste treatment,
- construction and maintenance of (i) facilities and devices used for environmental protection, (ii) reservoirs and other water facilities to supply water, regulate flows and protect against flood; tuning and maintenance of water and water land improvement facilities owned by the State Treasury or local government units; taking care of real estate being monuments within the meaning of the provisions of the Act on Conservation and Care of Historical Monuments.

Spatial planning in the area of technical infrastructure is problematic. According to Jeleński [2010], the building development and infrastructure networks in Poland are not formed as an element of logical urban layouts. The plots development is adjusted to their size and shape, while spatial context is ignored. As investing outside the city centre (although it has a large investment potential) is easier and cheaper, cities tend to spread to the suburbs and rural areas.

DESCRIPTION OF RURAL MUNICIPALITY OF NOWA SÓL

Nowa Sól is a rural municipality located in the south-eastern part of the Lubuskie Province (Figure 1). It belongs to the district of Nowa Sól and its area takes 176 km^2. In the east rural municipality of Nowa Sól borders on the municipalities of Sława and Siedlisko, in the south – on the municipalities of Kożuchów and Nowe Miasteczko, and in the north on the municipalities of Otyń, Bojadła, Kolsko and the town of Nowa Sól. The municipality consists of 18 villages (Buczków, Chełmek, Ciepielów, Dąbrowno, Jeziorna, Jodłów, Kiełcz, Lelechów, Lipiny, Lubieszów, Lubięcin, Nowe Żabno, Przyborów, Rudno, Stany, Stara Wieś, Stary Staw, and Wrociszów) and 5 hamlets (Drogoniów, Józefów, Okopiec, Radosławice, Stawy). It is inhabited by 6,829 residents; therefore, its population density is 39 people per 1 km^2 [CSO, BDL 2017].

The following rivers flow through the municipality of Nowa Sól: the Odra River and its tributaries, namely Czarna Struga (in the west), and Krzycki Rów (in the east). The southern part of the municipality is located in the Biała Woda basin, and the northern part – in the Obrzyca basin. The Odra River divides the municipality into two parts, eastern and western. Forests take 9,950.71 ha, which

accounts for 56.6% of the municipality area. Legally protected areas take 6,010.14 ha [CSO, BDL 2017]. Detailed data on technical infrastructure in the municipality are presented in Table 1.

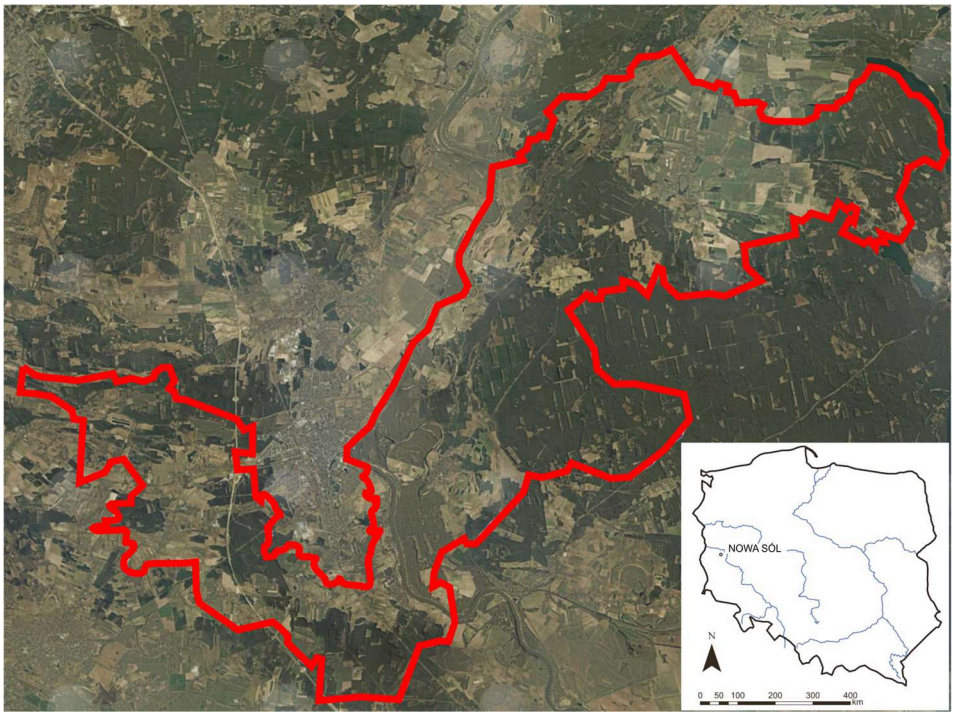

Fig. 1. Location of the research area

Tab. 1. Technical infrastructure in rural municipality of Nowa Sól

	Residential buildings connected to technical infrastructure - in % of residential buildings in total		
	Water supply system	Sewage system	Gas
	98.6	35.3	b.d.
The length of active system in km	76.3	40.3	25.6
Population using the system in %	96.0	42.0	11.3

The road network in the municipality covers 18 roads with a total length of 57.01 km. Technical condition of municipal roads is unsatisfactory – most of them have a ground surface. Roads with bituminous surface, due to numerous cracks and damage, should be repaired. The municipality has public roads of four categories: national roads (S3/65), provincial roads (292, 297, 315, 318, 320), district and municipal roads.

A high-pressure gas main runs from Głogów to Zielona Góra (Tab. 1), which supplies gas to two towns, mainly: Rudno and Lubieszów. The low-pressure gas main in Rudno was built at the initiative of social committee.

The municipality has an electricity grid, managed and owned by ENEA Operator. The grid may supply electricity to almost any plot, if necessary.

When it comes to water supply, the municipality of Nowa Sól, pursuant to the provisions of the Act on Municipal Government, performs its tasks through Zakład Gospodarki Komunalnej Sp. z o.o. in Kiełcz. ZGK operation includes the production, sale and distribution of water. The plant provides water supply services based on its own water intakes and purchase from MZGK Sp. z o. o. in Nowa Sól, supplying water to the following towns: Kiełcz, Wrociszów, Lubieszów, Stara Wieś, Stary Staw and Lelechów. Most towns have the water supply system (Tab. 1), except for three of them, namely: Buczków, Radosławice and Stawy.

Until recently, domestic sewage was discharged into septic tanks (as there is no sanitary sewage system). The municipality did not have a sewage treatment plant to which sewage system could be connected. In the years 2013-2014, a mechanical and biological wastewater treatment plant was built in Lubięcin, for which the municipality received a subsidy as part of the Rural Development Programme. At present, there are 1,092 septic tanks and 125 home sewage treatment plants in the municipality. 2,796 residents use the sewage treatment plant [CSO, BDL 2017].

POSSIBILITIES OF ADJUSTING CHANGES

The ideas of sustainable development are evident at all levels of managing urban areas. In recent years, technical infrastructure in rural municipality of Nowa Sól has developed considerably. However, the backwardness of recent years is still visible. The purpose of some areas is not systematized (local zoning plans do not cover them), which creates favourable conditions for the use of zoning decisions against sustainable development approach. Current documents often contain contradictory provisions, i.e. in some towns the use of individual sewage treatment systems is allowed, in others it is prohibited. The situation of rainwater management is similar. In accordance with the idea of sustainable development [Fiodor 2002, UNESCO 2017], rainwater should be used in the place of its occurrence, not discharged through rainwater sewage system, because its construction and maintenance is expensive and discharged rainwater overloads water tanks. The slowdown of water flow positively affects the water management as the humidity increases, the amount of pollution in tanks is reduced, and water resources are not limited [Januchta-Szostak 2014]. In order to reduce the outflow of rainwater and snowmelt the municipality ordered the construction of local

roads with an openwork surface. It favours environmental protection, and thus it is an inseparable part of development.

As current infrastructure requires expansion, the municipality may increase its efforts to obtain funds from the EU and other countries, which counts as international cooperation [Fiodor 2002]. As far as generational and intergenerational justice is concerned, a programme of uninterrupted construction of technical infrastructure should be developed so that all residents have access to it.

The municipality has investment areas in the vicinity of the town of Nowa Sól. It is worth considering the possibility of fitting them out as soon as possible, even at the expense of other investments [Land-use planning...]. Such an investment project could attract investors who would give jobs to the municipality residents, thus increasing their affluence and contributing to municipality development. When planning investment projects in the field of technical infrastructure, the authorities should consult their scope, place and order with residents [Journal of Laws 2018, item 2081].

Supplying gas to all households will encourage residents to start using gas for heating buildings, hence the emission of pollutants into the air will be significantly reduced. Currently, the vast majority of residents use solid fuels for heating, thus burning various types of rubbish, which negatively affects the quality of air and the environment.

As the municipality is located in the area with many sunny days, it would be recommended to grant residents wishing to use renewable energy sources (e.g. solar collectors) subsidies. This solution is worth considering in holiday resorts, where holiday cottages are used seasonally.

To reduce the amount of water used, it is recommended to promote water metering, eliminate leaks and gradually replace water supply system sections that are subject to frequent failures.

An adequate level of technical infrastructure is the basic factor in rural development. Infrastructure development may encourage entrepreneurs to pursue business activity in the municipality and invest in domestic and foreign capital, which in turn will increase the number of jobs.

Due to current condition of technical infrastructure, investment projects in the municipality are few and their execution is difficult, even though the municipality has investment areas available for business. Rural development and agricultural production growth substantially depend on economic potential and the condition of technical infrastructure. This means that the problem of technical infrastructure development of rural areas should be solved comprehensively, i.e. in terms of technical, economic and strategic aspects, and the conditions of investment processes. This is the only way to overcome barriers that limit rural development.

CONCLUSIONS

Sustainable development assumes that all residents of the municipality have equal rights when it comes to access to technical infrastructure. It affects economic and social growth and the condition of environment and forms the grounds for sustainable development. The rural municipality of Nowa Sól is an administrative unit with a large number of towns and villages, considerably dispersed. The lack of zoning plans hinders the municipality development and the execution of investment projects related to the construction and coherent development of technical infrastructure.

It should be noted that in recent years, the number of technical infrastructure facilities has increased significantly and includes water supply system (currently water is supplied to most towns), sewage system (built in six towns), or new sewage treatment plant. Many villages, however, still do not have gas mains and sewage system, which adversely affects the region's development potential.

The support and involvement of residents in the construction of gas mains and sewage system in the village of Rudno should become an example encouraging other residents to work together for further development of the municipality.

Based on the analysis of the infrastructure in the rural municipality of Nowa Sól, the following conclusions are drawn:

- despite significant increase in technical infrastructure, delays in comparison to other municipalities of the Lubuskie Province are still visible; it is necessary to expand gas mains in order to improve the quality of air in the winter, thus creating favourable conditions for residents to live in comfort,
- only a small number of towns and villages in the municipality has developed local zoning plans (about 10% of the area),
- renewable-energy power plants, which are essential for air quality improvement in the municipality and for diversification of energy sources for rural areas, are used to a limited extent,
- due to dispersed building development and the lack of sewage systems, especially in small towns, the construction of individual wastewater treatment plants should be considered; the sewage treatment plant built in the eastern part of the municipality (in Lubięcin) will enable the construction of sewage system in this area in the future and will improve the living comfort of its residents. It will also have a positive impact on the environment, which is an element of sustainable development.

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