

The Real Estate Market in the Context of Municipal Management. Example of the Lublin Functional Area

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Abstract

The article aims at the determination of relations between the real estate market and water supply and sewage management based on the example of the Lublin Functional Area (LFA). The paper is composed of two parts. The first part focuses on the characteristics of functional urban areas (FUA) both in the context of theoretical assumptions and practical aspects of their implementation under the Cohesion Policy 2014–2020 in Poland, as well as development problems of FUA resulting from the intensity of the process of suburbanization. The second part of the article presents the characteristics of LFA and the analysis of the relations between an increase in dwelling stock and the real estate market in the communes of LFA and their provision in water supply and sewage infrastructure. It also presents problems caused by uncontrolled expansion of built-up areas in the context of conducting sustainable municipal management in areas with high values for agricultural production in spatial, socio-economic, and environmental terms.

Keywords: functional urban area (FUA), Lublin Functional Area, real estate market, municipal management, suburbanization

JEL: O18, R23, R31, R38, R53

Introduction

In regional policy, particular attention is paid to cities and their functional areas, and determining their key role in the development of regions. A functional area is space designated based on common geographic parameters and internal relations. The housing area is a particularly important component of the space. It determines its social boundaries, life rhythm, and flow of people. It also constitutes an important component of the economy of the area. An increase in the population and not always fully controlled intensive development of housing in suburban areas result in strong urbanization pressure. This generates new challenges for municipal management. In the context of the quality and comfort of life of residents, access to the water supply and sewage network is very important. Because the provision of key infrastructure elements for building development is the task of the commune, and communes are not always able to obtain financing for new investments, in practice the network development does not keep up with building development in suburban areas. Such a situation generates a number of problems in the socio-economic sphere, and has a negative effect on the environment. It is particularly important in the case of functional urban areas (FUA)

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constituting a food-zone due to their high environmental values, and covered by various forms of protection. An example is the Lublin Functional Area (LFA), characterized by a high—in comparison to the remaining part of the voivodship—ratio of housing development intensity, concentrating half of the effects of its activity, and a more than 55% share of transactions concerning buildings. In combination with an evident shortage of water and sewage infrastructure and in the majority of communes slow expansion of municipal networks in recent years, this constitutes a serious threat not only for the environment, but also for the sustainable development of the entire LFA.

The article aims at the determination of the relations between the real estate market and municipal management in LFA. It focuses on the analysis of relations between the expansion of the dwelling stock in the communes of LFA and their provision with water supply and sewage infrastructure. It also presents problems caused by uncontrolled expansion of built-up areas in the context of conducting sustainable municipal management. Detailed analyses covered all 16 communes included in LFA. They are based on data collected in the Bank of Local Data within the National Information System SIMIK, and data obtained directly from websites of particular communes. The study covered the period from 2003 (before Poland's accession to the EU) to 2015 (after the completion of implementation of investments from the EU perspective 2007–2013).

1 Functional Urban Area—definition, delimitation, development issues

Cities and their functional areas have become a subject of interest of the EU regional policy conducted in the place-based and territorial approach in recent years (Barca 2009; Barca, McCann, and Rodriguez-Pose 2012; Markowski 2013; Szafranek 2015; Szlachta and Zaucha 2014). Their potential in the development of regions and countries has been recognized. New tasks have been designated, including the strengthening of the competitiveness of regions and mechanisms of competition, and a distinctive territorial approach has been established (including policy towards rural areas and urban policy) (McCann and Ortega-Argilés 2013). This is reflected in provisions of documents at the EU level—i.e., the Leipzig Charter, 2007; Europe 2020 Strategy, 2010; Territorial Agenda of the European Union 2020, 2011, and particularly the Pact of Amsterdam, 2016. In the financial sphere, it results in the introduction of the new tools of the Cohesion Policy 2014–2020 dedicated to support of sustainable development and growth of competitiveness of cities, particularly including Integrated Territorial Investments (ITI) in the financial sphere, and functional urban areas in the strategic-planning sphere (Kaczmarek and Kociuba 2017).

In the Polish system of spatial planning, functional urban areas (FUA) appeared together with the passing of the National Spatial Development Concept 2030 (hereinafter: NSDC 2030).¹ According to NSDC 2030, the functional urban area is a spatially continuous settlement system composed of administratively separate units. It covers a compact urban area and the functionally related urbanized zone. In administrative terms, such areas can include urban, rural, and urban-rural communes (page 187). NSDC introduces a typology of FUA with consideration of cores and external zones, and designates four types of FUA: voivodship centers (hereinafter: VC FUA), regional centers, subregional centers, and local centers. Pursuant to the provisions of NSDC 2030, VC FUA replaced metropolitan areas. The term FUA was introduced to the Polish legislature by the amendment of the Act on spatial planning and management of 2014,² where the “functional urban area of a voivodship center” is defined as a type of “a functional area covering the city constituting the seat of the voivodship self-government or voivode, and its direct vicinity related to it in functional terms” (art. 2 par. 6b). Pursuant to art. 49b, VC FUA are included to functional areas with supraregional importance, and should be delimited in the voivodship spatial management plan.

The majority of voivodships, before the amendment of the act had already commenced works on the delimitation of VC FUA in accordance with various ratios and rationales. However, in 2012, due to the decision of Poland concerning the implementation of a new tool of the EU Cohesion Policy

1. See: Koncepcja Przestrzennego Zagospodarowania Kraju 2030. [National Spatial Development Concept 2030], 13 December 2011, [at:] http://mr.bip.gov.pl/strategie-rozwoj-regionalny/17847_strategie.html.

2. See: Ustawa z dnia 27 marca 2003 r. o planowaniu i zagospodarowaniu przestrzennym. DzU z 2013 r. nr 80 poz. 717, as amended.

2014–2020, namely Integrated Territorial Investments (ITI) and stating their obligatory character in VC FUA, works on their delimitation were commenced on the national level. A delimitation was developed (Śleszyński 2013), and implemented in VC FUA with various effects and with the application of various approaches (Kociuba 2017). However, it provided the basis for the establishment of stronger cooperation of cities and communes in the majority of 17 VC FUA (Kaczmarek and Kociuba 2017).

Lack of such cooperation resulting from being accustomed to governance within their own administrative boundaries led to the majority of problems and conflicts currently faced by cities and their neighboring communes. They particularly include the intensification of suburbanization which in Poland frequently occurs in a chaotic way. Uncontrolled “urban sprawl” brings unfavorable consequences, the most important being: problems related to transport and communication, conflicts in land use, pressure on the natural environment, or problems with management in the metropolitan area (Kaczmarek 2014).³ Uncontrolled urban sprawl is also accompanied by a considerable increase in social and economic costs of suburbanization processes (Kowalewski et al. 2014), and restrictions in the context of spatial planning (Kociuba 2015). Such a situation results particularly from the imperfections of strategic planning, as well as often evident special interests and lack of experience in planning and implementation of integrated investments exceeding the administrative boundaries of a given unit. Lack of cooperation between communes and counteracting negative suburbanization processes leads to the intensification of urban sprawl and spatial chaos. Lack of integration in the sphere of governance and planning resulting from the strong position of communes and failure to consider the actual situations of neighboring communes (lack of coherent information) causes the dispersion of investments, and particularly utility infrastructure (Kaczmarek 2014).

An important role in delimitation, governance, and management of FUA is played by the strength of internal connections between the core city and its functional area. They are particularly expressed in: commuting, land-use intensity, value of flow of goods and services of different characters, mutual relations between the labor market and housing market, technical infrastructure, and environmental structures. The relations in the scope of the real estate market and municipal infrastructure will be analyzed further in the paper based on the example of the Lublin Functional Area.

2 Characteristics of the Lublin Functional Area

LFA includes three zones (rings) around Lublin, differing in the intensity of settlement processes and degree of socio-economic development (Kociuba, forthcoming). The first settlement ring is comprised of communes directly surrounding Lublin (i.e., Głusk, Jastków, Konopnica, Niemce, and Wólka—fig. 1). It has the highest number of residents choosing life “outside of the city.” Those communes have the most convenient access to Lublin through the road and public transport network. Their residents are related to Lublin through commuting to work and school. The second ring (type IIA), covering the following communes: Niedrzwica Duża, Mełgiew, and Lubartów (rural and city commune), is characterized by convenient location at the main roads (S17, S12, and S19), and vicinity of the core cities, serving as labor markets for their residents. The communes of the second ring (type IIB) (i.e., Nałęczów, Jabłonna, Spiczyn, Strzyżewice, and Piaski) are characterized by lower attractiveness in terms of settlement. They are mostly agricultural areas, located—with the exception of the Piaski Commune—far from the main transport routes. The arrangement of the rings shows a strong position of Lublin and Świdnik as core centers of the LFA, and intensification of suburbanization processes in their vicinity (Kociuba, forthcoming).

One of the primary factors characterizing LFA and distinguishing its space on the background of the voivodship is its demography. The intensity of processes occurring in the area and flow

3. See: Procesy suburbanizacji — uwarunkowania, formy i konsekwencje. Presentation by Andrzej Lisowski and Mirosław Grochowski at Seminarium Ministerstwa Rozwoju Regionalnego: „Problematyka rozwoju obszarów miejskich, w tym obszarów metropolitalnych w koncepcji Przestrzennego Zagospodarowania Kraju 2008–2033”, Warsaw, 28 February 2008 r., [at:] https://www.researchgate.net/profile/Andrzej_Lisowski/publication/265110412_PROCESY_SUBURBANIZACJI_uwarunkowania_formy_i_konsekwencje/links/56a7d21b08ae997e22bc1ac8/PROCESY-SUBURBANIZACJI-uwarunkowania-formy-i-konsekwencje.pdf?origin=publication_detail.

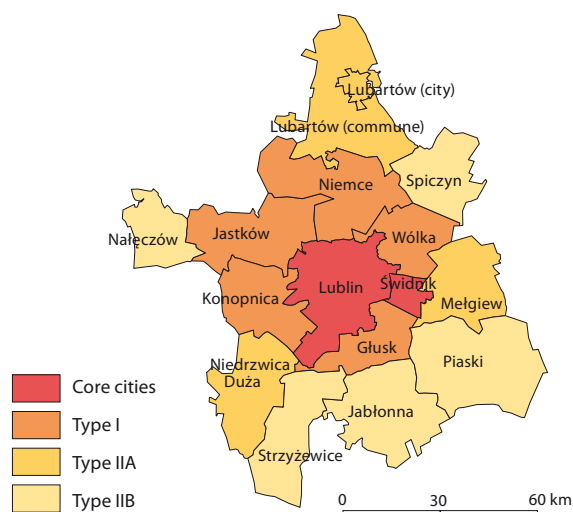


Fig. 1. Distribution of communes in the Lublin Functional Area

directions determine its specificity. In 2015, the Lublin Functional Area, with a contribution in the area of the voivodship at a level of 6,3%, had 25,4% of the population in its area.⁴ Due to an increase in the number of residents in communes comprising LFA by a total of 1,3 thousand people, and its decrease in the voivodship by a total of 54,4 thousand in the period from 2003 to 2015, the contribution increased by 0,6 percentage point. The analysis of data on the level of particular local government units (LGU), however, shows evidently different tendencies in urban and rural communes. In the analyzed period, cities lost from 3,3% of the population according to the state from 2003 (Lubartów) to 13,3% (urban area in the urban-rural Nałęczów Commune). At the same time, urban communes and the majority of rural areas in urban-rural communes of LFA recorded an increase in the number of residents. It was the highest in the communes of the first ring. In the period 2003–2015, the population of the Głusk Commune increased by 50,3%, Wólka—by 39,0%, and the number of residents in the Konopnica Commune increased by one fourth.

Changes in the size of population in a given area result from two factors: natural increase defined as a difference between the number of live births and the number of deaths in a given period,

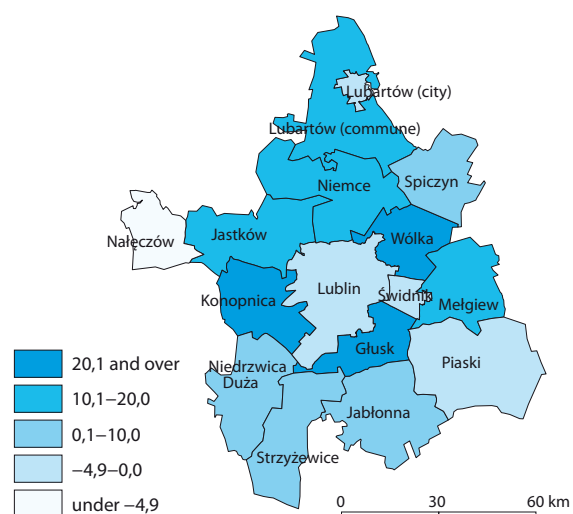


Fig. 2. Change in the size of population in communes of LFA in the years 2003–2015 (in %)

Source: Own elaboration based on the data published by Central Statistical Office of Poland at Local Data Bank website (<https://bdl.stat.gov.pl/>)

4. [In the journal European practice of number notation is followed—for example, 36 333,33 (European style) = 36 333.33 (Canadian style) = 36,333.33 (US and British style).—Ed.]

and the net migration expressed as the difference between the number of people incoming to a given area and its outflow from the area in a given period (Holzer 1963). Mean values adopted by the first of the analyzed factors varied from $-4,18$ (Piaski Commune) to $4,94$ persons per 1 thousand residents (Wólka Commune). The high dynamics of changes in the number of population of the functional area of Lublin were therefore determined by migration processes. Information presented in figure 3 emphasizes a different course of demographic processes than in the remaining part of the voivodship. The intensification of migration is considerable in communes neighboring on the majority of cities in the Lubelskie region. It is closely related to the intensity of suburbanization processes and outflow of population from cities to suburban zones. In LFA, however, it occurs to the largest degree. The largest migration outflows are recorded in cities (12 thousand in Lublin in the years 2003–2015), and inflows in the majority of rural communes of the first and second ring (i.e., Jastków, Niemce, Wólka, Konopnica, Mełgiew, Głusk, Jabłonna, Strzyżewice, and Lubartów).

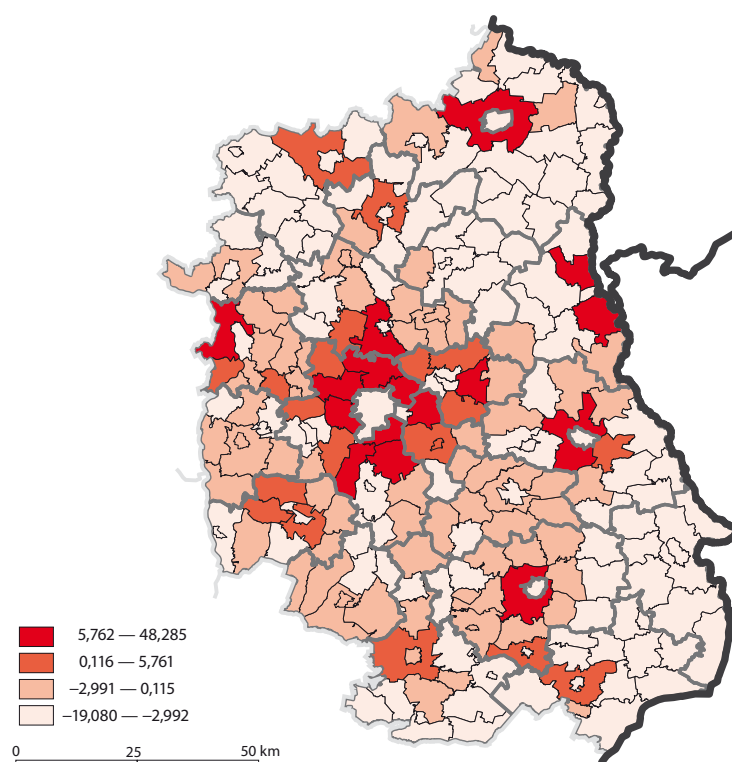


Fig. 3. Net migration (per 1000 persons) in the Lubelskie Voivodship in the years 2003–2015

Source: Own elaboration based on Nocko (2017)

A characteristic feature of both historic and modern migrations is the fact that their participants are primarily young people of productive age (Dymek 2017), and they are determined by their striving for the improvement of living conditions. This is confirmed by data regarding activity in the area of housing development and investments in the scope.⁵ As much as 40%–50% of housing investments are implemented in LFA, inhabited by somewhat more than 1/4 of the population of the voivodship.

In this context, the description of the Lublin Functional Area must include issues related to land management, and particularly land use. The agricultural production space valorization index in the case of the Lubelskie Voivodship determined at a level of 74,2 points, is the third highest among Polish voivodships (Witek 1993). With the exception of the Spiczyn and Lubartów communes, the value of the index, applied in the assessment of the natural conditions for conducting agricultural production activity, exceeded the mean value for the voivodship (fig. 4). As a result,

5. See: Budownictwo mieszkaniowe w województwie lubelskim w 2015 roku. [Housing development in the Lubelskie Voivodship in 2015], Opracowania Sygnalne, Urząd Statystyczny w Lublinie, May 2016, [@:] <http://lublin.stat.gov.pl/download/gfx/lublin/pl/defaultaktualnosc/748/4/8/1/budowmiesz2015.pdf>.

a conflict occurs in the area between the agricultural and residential function the development of which causes the exclusion from use of land with the highest value guaranteeing the highest efficiency of conducting agricultural activity.

The degree of the phenomenon will be analyzed in reference to the communes of LFA.

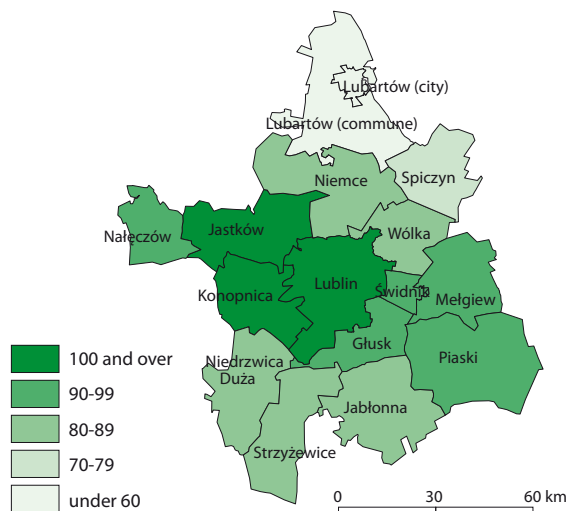


Fig. 4. Valorization of agricultural production space in LFA

Source: Own elaboration based on Witek (1993)

3 Real estate market and the dwelling stock in LFA

The real estate market is usually defined as total conditions under which a transfer of rights to land occurs through sale and purchase transactions; a collection of mechanisms of transfer of rights and interest in real estate, determination of prices, and movement of different types of land use. Potential demand in the market, associated with the demand for a given commodity, becomes the actual effective demand at the moment of obtaining support in the form of financial resources, offering a chance for its satisfaction (Kucharska-Stasiak 2006). In the same market, demand is created by all types of real estate: dwellings, buildings, and land. Due to their different character in terms of their use, however, they are considered as separate and independent markets.

The most important features of the real estate market in addition to low sensitivity to price changes in a short period of time, demand, and supply, include its local character. This is related to a permanent binding of the real estate to land and lack of possibility of its relocation. This feature is also manifested in sensitivity to local conditions in the scope of demographic structure, labor market, or availability and price of land (Kucharska-Stasiak 2006). Pursuant to art. 3.1. of the act on spatial planning and spatial management, the “development and conducting of the spatial policy in the territory of the commune, . . . is the task of the commune.”⁶ One of the tools of spatial management and stimulation of local development available to communes is management of real estate constituting their property.⁷ They do it not only by sales and transfer into perpetual usufruct, but also through collecting land, its consolidation, and then sales to entities interested in construction works in such areas (Myna 2011; Myna, Matacz, and Zabiegły 2015). This way communes can also actively influence the local real estate market. In 2015, the communes of the Lubelskie Voivodship owned 889,3 ha of land for housing development. 85% of the area was land for single family housing. The resources of communes included in LFA comprised 84,1 ha of land for housing development, including 43,5 ha for multi-family housing, and 40,6 ha for single family housing. Only 9 self-governments used this type of resources. Only four of them, namely the cities of Lubartów, Świdnik, Lublin, and the Lubartów Commune, had resources with an area exceeding

6. See: Ustawa z dnia 27 marca 2003 r., op. cit.

7. See: Ustawa z dnia 21 sierpnia 1997 r. o gospodarce nieruchomościami. [Act of 21 August 1997 on real estate management]. DzU z 1997 r. nr 115 poz. 741, as amended.

5 ha. In the years 2008–2015, communes included in LFA transferred a total of 44,5 ha of land for housing development to investors. It is worth emphasizing that 2/3 of the value concerned the self-government of Lublin. Moreover, the communes of LFA—except for Lublin, where in the analyzed period the area of land owned by the city increased by more than 1/4—showed no particular activity or interest in increasing the resources. Their resources decreased or remained on the same level.

A consequence of high dynamics of demographic processes as well as activity of investors in the scope of housing development is the equally high and constantly increasing contribution of LFA in the number of sale and purchase transactions concerning real estate in comparison to the remaining part of the voivodship. The comparison of the number of transactions concerning housing real estate concluded in 2015 in Lublin with the total housing resources at a level of 1,7% permits the evaluation of the market as one that is developing. A considerably lower ratio is determined in reference to the remaining communes included in LFA. A very low value at a level of 0,4% of the dwelling stock is justified, however, considering the fact that the major portion (systematically increasing to a level of 85,0% in 2015) of dwellings completed in such areas was built by individual investors with the purpose of meeting their own residential needs, and only 7,2% was built for sale or rental.

Lublin is dominant in the voivodship market of the commercial real estate market to an even greater degree than in the case of the residential real estate market. Two out of three transactions in the Lubelskie Voivodship concerned real estate located in Lublin. The contribution exceeds the mean level for the country that amounted to somewhat more than 50%. Due to the physical restrictions on supply, however, namely the exhaustion of resources, particularly in reference to land properties for housing development, the activity of investors is shifted from the core of LFA to the external zone. Whereas in 2009 less than 2/3 of properties subject to turnover were located within the boundaries of Lublin, in 2015 a slight quantitative prevalence was recorded of land located in the remaining communes of the functional area. This is also confirmed by data concerning the number of real estate sale and purchase transactions per 1 thousand residents of the area (fig. 5).

The comparison with data for 2009 particularly reveals a considerable increase in the values of the coefficient in all rural communes (e.g., in the Strzyżewice Commune, its three-fold increase was recorded), whereas in cities, the change did not exceed two transactions. In the case of Lublin, the coefficient was maintained on a practically unchanged level.

The value of real estate properties, both newly built and existing, primarily depending on their location shows high spatial variability (Myna, Matacz, and Zabiegły 2015). This is confirmed by data concerning LFA. The contribution of sale and purchase transactions regarding properties located in LFA in the total value for the voivodship is even higher than in the quantitative approach. Sale and purchase transactions concerning housing within Lublin constituted 70,2% of the volume of transactions of the type in the voivodship. The remaining communes comprising the Functional

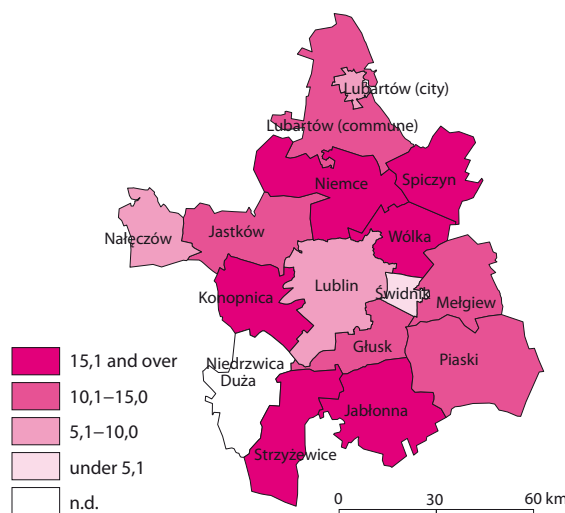


Fig. 5. Number of real estate sale and purchase transactions per 1 000 residents in the communes of LFA in 2015

Source: Own calculations based on data from the Register of Prices and Values of Real Estate

Area accounted for 7,3% of the value in 2015. Sale and purchase transactions concerning properties located outside LFA constituted only 22,5% of the value in the voivodship.

The availability of dwellings is particularly determined by the level of wealth of the society (Cesarski 2016). A housing shortage directly translates into conditions of functioning of households, and generates and intensifies related conflicts (Łaszek, Olszewski, and Waszczuk 2017). According to data of Eurostat, only in two voivodships, namely the Łódzkie and Mazowieckie voivodships, the level of satisfaction of residential needs of households, measured by the number of dwellings per 1000 people, exceeds the mean level in the European Union. High capital-intensity of the investments and the long period of their implementation constitute the main barriers to increasing the dwelling stock (Główka 2012; Kucharska-Stasiak 2016).

LFA, inhabited by somewhat more than 1/4 of the population of the voivodship, includes as much as 40%–50% of housing investments. Importantly, the investments are accounted for in an approximate scale—measured with number of population—by the city of Lublin, as well as the remaining communes included in LFA (fig. 6), whereas in the area of Lublin multi-family housing is dominant, and in suburban areas—single family housing (Nocko and Żelechowski 2011).⁸

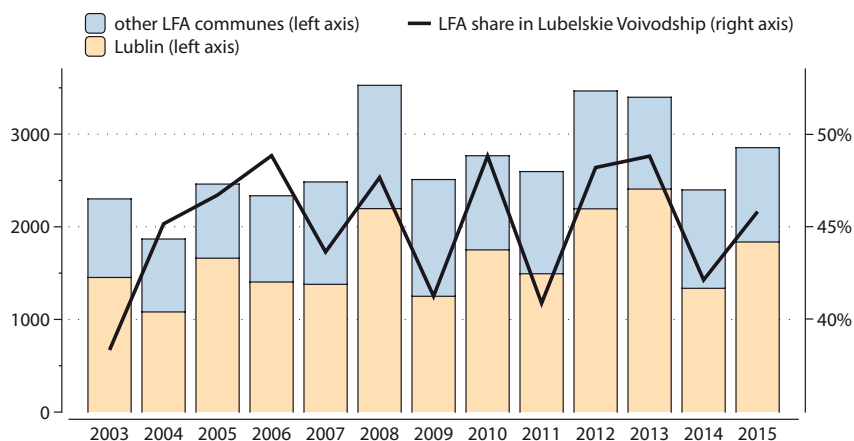


Fig. 6. Dwellings completed in LFA in the years 2003–2015

Source: Own elaboration based on the data published by Central Statistical Office of Poland at Local Data Bank website (<https://bdl.stat.gov.pl/>)

A comparison of the effects of housing development activity with the number of population inhabiting particular GLU shows substantially higher activity of investors in suburban areas than in their equivalents in cities. This suggests intensification of suburbanization processes. The ratio of dwellings completed per 1 thousand residents in the Konopnica and Wólka communes in 2003 exceeded the mean value for the voivodship almost five times, and in 2015 it was five times higher than in the Głusk and Wólka communes. The intensity of building development and pressure on the environment is also manifested by the ratio of dwellings completed per 1 km² of registered area of rural communes. Whereas the mean value in the voivodship amounted to 3,1, in the Wólka and Głusk communes—with the highest values for agricultural production—it exceeded 20.

In spite of intensive building development in the area of LFA, residential conditions expressed in the ratio of number of dwellings per 1000 residents do not deviate in plus from the mean value for the voivodship which in 2015 amounted to 355,9 apartments. Only in three of the analyzed administrative units: in Lublin, Nałęczów, and Świdnik, values higher than mean values for the Lubelskie Voivodship were recorded. In the Niedrzwica Duża commune and rural commune of Lubartów, the ratio was still below 300. This suggests that residential needs, both in qualitative and quantitative terms, are still not fully met. Thus, continued high demand for dwellings should be expected, and as a result high pressure on the environment. In the context of the quality of housing resources evaluated based on the degree of their provision with basic devices and installations,

8. See: *Budownictwo mieszkaniowe w województwie lubelskim...*, op. cit.

such variability of the dwelling stock constitutes a serious challenge for the communes of LFA in the scope of conducting sustainable municipal management.

4 Municipal management in LFA in the years 2003–2015

In accordance with the statutory definition, “municipal management particularly covers public purpose tasks, aimed at current and continuous satisfaction of collective needs of the population through the provision of commonly available services.”⁹ One of its branches is water supply and sewage management. It constitutes a group of investments, organizational, technical, and legal undertakings related to the efficient use of collected water, and then efficient discharge of the resulting sewage (Kaca 2006). Water and sewage management is the task of the commune. This results in certain restrictions, particularly in financial terms.

EU funds that communes could obtain in the perspective 2007–2013 were certainly a remedy to such problems. Communes of LFA benefitted from them to a low degree. In the scope of EU funds (under the Operational Programme Infrastructure and Environment, Operational Programme Development of Eastern Poland, and Regional Operational Programme), 13 km of water supply network and 92 km of sewage network was constructed in LFA.¹⁰ The cooperation of communes in the implementation of common investments—the basic source of success in the development of a coherent network—was insufficient. Only one common project was implemented, entitled “Expansion and modernization of the water supply and sewage system in Lublin—stage II.” Its implementation involved Lublin and Głusk. Therefore, the majority of investments was implemented from own resources of the communes.

In the context of intensification of suburbanization processes in LFA, an increase in the length of the network and therefore an increase in its density is particularly important. The analysis of changes in the network’s expansion in the years 2003–2015 shows an increase in the length of the water supply network in 14 out of 16 communes (fig. 7). The greatest changes occurred in cities: Świdnik, Lublin, and Lubartów. They are also characterized by the highest density of the networks. Among urban communes, the highest density of the network concerns the communes of the first ring, namely Głusk and Wólka, as well as Niemce. In the remaining cases, the expansion

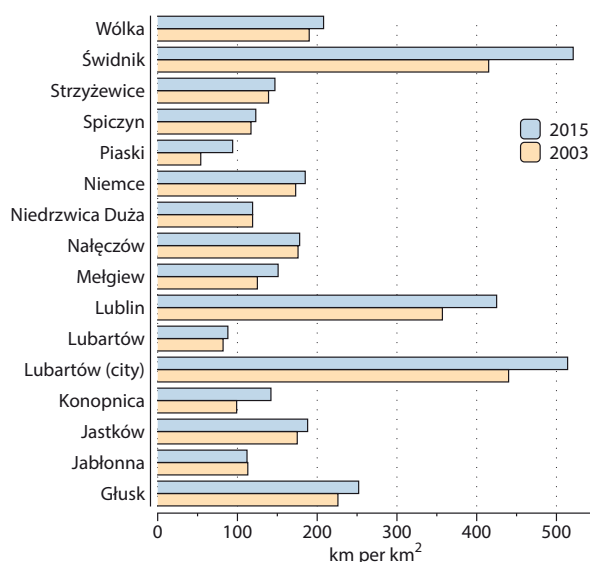


Fig. 7. Comparison of the length of the water supply network in the years 2003 and 2015

Source: Own elaboration based on the data published by Central Statistical Office of Poland at Local Data Bank website (<https://bdl.stat.gov.pl/>)

9. See: Ustawa z dnia 20 grudnia 1996 r. o gospodarce komunalnej. [Act of 20 December 1996 on municipal management], DzU z 1997 r. nr 9 poz. 43, as amended.

10. See: Data based on the System Informatyczny Monitoringu i Kontroli (SIMIK)

of the network was inconsiderable. In the Jabłonna and Niedrzewica Duża communes in the years 2003–2015, no expansion of the water supply network occurred.

In the case of the sewage network, its considerably greater expansion is observed in comparison to that of the water supply network, particularly in rural areas. The length of the sewage network in the case of rural communes in 2015 is more than twice higher than in 2003. The greatest increase in the density of the network was observed in cities, and among rural communes in those located within the first ring (i.e., Wólka, Jastków, Głusk, and Konopnica). It should be emphasized that the two latter communes, as well as the Mełgiew, Niedrzewica Duża, and Jabłonna communes, had no sewage network in 2003, and in 2015 this concerned only the Jabłonna Commune (fig. 8).

From the point of view of rational water supply and sewage management, quality of life, and environmental protection, the disproportion between the length of the water supply and sewage networks is a very important issue. This disproportion occurs in all communes of LFA (except for Lublin). The greatest difference in the length of the sewage network as compared to the length of

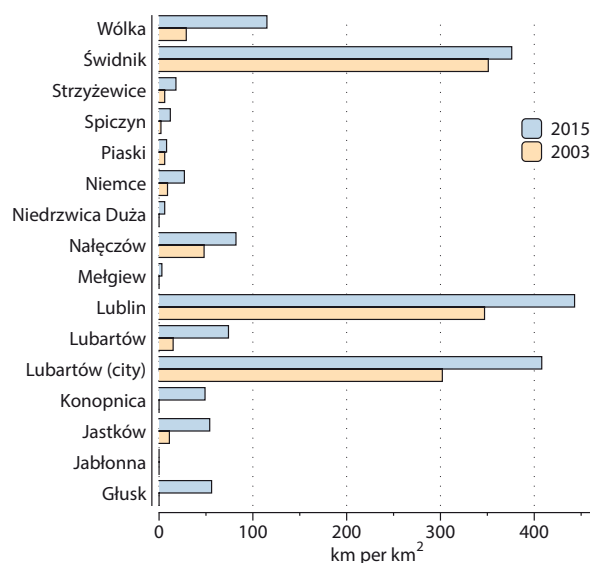


Fig. 8. Comparison of the length of the sewage network in the years 2003 and 2015

Source: Own elaboration based on the data published by Central Statistical Office of Poland at Local Data Bank website (<https://bdl.stat.gov.pl/>)

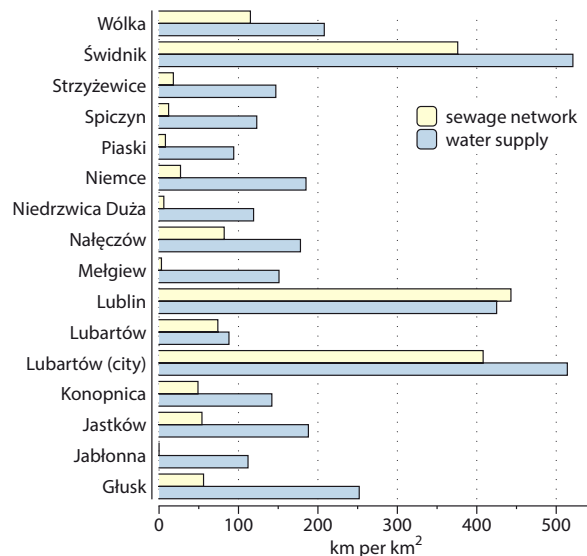


Fig. 9. Comparison of the length of the water supply and sewage networks in 2015

Source: Own elaboration based on the data published by Central Statistical Office of Poland at Local Data Bank website (<https://bdl.stat.gov.pl/>)

the water supply network in 2015 was noted in the Głusk Commune—196 km per km² and the Niemce Commune—158 km per km². The greatest deficit of the sewage network concerned the communes of the second ring, namely Jabłonna, Mełgiew, and Niedrzwica Duża (fig. 9), where the length of the sewage network constitutes 0,1%, 1,7%, and 5,3% of the length of the water supply network, respectively.

In order to fully understand the consequences, the degree of provision of dwellings with water supply and sewage infrastructure should be analyzed. Except for newly completed dwellings which pursuant to the binding provisions are all equipped with water supply (local or connected to the network), dwellings without a bathroom still have a substantial share—even up to 40% in the Piaski Commune. In spite of expansion of the sewage network in recent years, progress in the scope of provision of housing with sewage infrastructure is unsatisfactory. In 2003, the wastewater treatment plant¹¹ was used by 77,8% of the population inhabiting communes of the Lublin Functional Area. The same ratio in 2015 increased by only 1 percentage point. Whereas in the case of Lublin the small improvement of the ratio from 96,4% to 97,3% is justified by the specificity of the resources (this primarily concerns the population residing in the oldest housing where modernization is particularly costly and difficult in technical terms), it does not explain the low dynamics in the case of the remaining communes of LFA (from 42,0% in 2003 to 47,9% in 2015). Detailed analyses show a considerably higher complexity of the issue. Considering the number of population using the sewage network as compared to the number of septic tanks without outflow (so called cesspools) in the communes of LFA, it should be emphasized that whereas in cities more than 90% residents use the sewage network, the majority of the population of the rural communes of LFA discharges sewage to septic tanks. It is particularly undesirable in communes with the highest quality arable land—i.e., in the communes from the first ring: Konopnica, Niemce, Jastków, Głusk, as well as the second ring: Piaski, Mełgiew, Jabłonna, Strzyżewice, and Niedrzwica Duża (tab. 1).

The primary barriers for the improvement of the situation include growing problems in provision of scattered dwellings with infrastructure, and particularly the costs of such an undertaking, as well

Tab. 1. Number of septic tanks (state as at 31 Dec 2016) and share of population using the water and sewage networks in the communes of LFA (state as at 31 Dec 2016)

Commune	Number of septic tanks	Population using the water supply network (%)	Population using the sewage network (%)
Głusk	1 849	96,6	22,3
Jabłonna	1 435	93,3	0,3
Jastków	2 560	85,4	25,6
Konopnica	2 561	50,7	13,8
Lubartów (city)	111	97,8	93,2
Lubartów	851	96,3	65,8
Lublin (city)	2 620	95,4	91,7
Mełgiew	1 500	93,1	2,0
Naęczów	470	87,7	42,7
Niedrzwica Duża	1 378	73,9	3,6
Niemce	3 169	86,0	28,6
Piaski	1 330	81,1	21,0
Spiczyn	770	95,0	12,5
Strzyżewice	1 170	87,7	18,4
Świdnik (city)	188	97,0	94,4
Wólka	1 187	100,0	41,1

Source: Own elaboration based on the data published by Central Statistical Office of Poland at Local Data Bank website (<https://bdl.stat.gov.pl/>)

11. Population using the wastewater treatment plant also includes persons residing in dwellings equipped with septic tanks.

as inconsiderable cooperation of communes in the scope of implementation of common undertakings and development of a common water supply and sewage system. In perspective 2007–2013 in LFA only one common project was implemented, involving Lublin and Głusk. The situation is slightly better in the case of use of common transmission networks. In the scope of sewage network, this concerns the Głusk, Konopnica, Mełgiew, and Świdnik communes which discharge sewage to the wastewater treatment plant Hajdów in Lublin. In the case of water transport through water supply networks, Głusk cooperates with the city of Lublin and Jabłonna, Konopnica sells water to the Jastków and Niedrzwica Duża communes, and Świdnik cooperates with the Mełgiew commune. Thus, combined with successive expansion of the network, water from the water supply network is obtained by 92,9% of residents of LFA. Due to considerable deficits in access to the sewage network, however, septic tanks are prevalent in the majority of rural and urban-rural communes of LFA. Negative effects of this kind of sewage discharge are often leaking cesspools, resulting in the release of sewage to the soil and ground- and surface waters causing their pollution, and in extreme cases — contamination.

Summary

The Lublin Functional Area is a classic example of the intensification of urbanization pressure on areas with high environmental values. The expansion of the “urban sprawl” phenomenon and the related dispersal of building development in rural communes increases the cost of provision of infrastructure. In combination with the deficit of technical infrastructure, this leads to many threats in spatial (increasingly chaotic building development), economic (limitation of the investment and development perspectives of the functional area), social (deterioration of the quality and comfort of life of residents), and particularly environmental terms (pollution of soils and surface and ground waters).

For external communes, the “urban sprawl” phenomenon means an increase in demand for land properties and the resulting increase in their value (Myna, Matacz, and Zabiegły 2015). This generates a number of problems, from allocation of fertile soils for building development and their exclusion from agricultural production, to generating negative environmental effects. In recent years those result in an disproportionate increase in the water supply network as compared to the sewage network, particularly in areas neighboring large cities (Piszczek 2013), causing pollution of soil and groundwaters (Kłós 2013). According to Świątek (2003), the basic problem concerns the attitudes of local self-governments and people for whom the water supply network is included in the basic infrastructure of the building plot, but the sewage network or on-site sewage facilities require higher expenditures, and are perceived as an additional expense and not as a component increasing the standard of life and limiting the degradation of the natural environment. A change in such an attitude is difficult, particularly when the majority of investments are financed from own resources of communes. Due to insufficient funds for the expansion of the network, its development is slow, and the distribution of the investment is interim and spatially scattered. Lack of cooperation between communes is also evident. A remedy to the situation seems to be greater activity of communes in obtaining EU resources for supralocal infrastructural projects (Kocur-Bera 2011).

Considering the analyzed phenomena occurring in the suburban areas, suburbanization is not only a serious problem in spatial, environmental, and socio-economic terms. It is also still a great challenge for researchers and entities involved in the monitoring process, and particularly for Official Statistics. The intensity of investments and measures, and their high variability particularly requires abandoning the consideration and analysis of the reality within administrative boundaries in favor of a functional approach guaranteeing greater precision of description and therefore better investigation and understanding of the observed phenomena.

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