



Original article

## Fast and uncoordinated suburbanization of Vilnius in the context of depopulation in Lithuania

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### ABSTRACT

Like many other Central and Eastern European countries Lithuania has been experiencing significant socio-spatial transformations since the 1990s. One of the most prominent of these transformations is associated with the residential suburbanization of its major cities. The suburbs are the only areas in Lithuania where the population has been growing in recent decades, while the country has lost almost one quarter of its population. Although, extensive urban growth is a common feature for all large Lithuanian cities, it is more noticeable in Vilnius. Due to its historical and geographical context, Vilnius, and the region surrounding it, is in an area where rural-urban transformation also means transformation of the social, ethnic, and political landscape. The aim of this article is to obtain more insight into the recent process of the fast, but weakly controlled, residential suburbanization of Vilnius. The focus is on understanding the scale of suburbanization and its impact on the social and physical environment. In this study, we use quantitative data on population and residential constructions as well as presenting some visual material. Our results show that the new suburban-style settlements are spatially dispersed. New residential areas have emerged within the city limits, along its administrative boundary as well as in the most peripheral parts of the Vilnius metropolitan region. In terms of the morphology and physiognomy, a great suburban diversity exists in and around Vilnius, and different building styles are mixed creating a rather chaotic landscape, with little interference from urban planners and no clear vision for the future.

KEY WORDS: suburbanization, depopulation, rural-urban change, Vilnius, Lithuania

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### 1. Introduction

Research on suburbanization – its impact both on the suburbs themselves and on the city as a whole – has long been among the most popular topics on the agenda of urban studies and thus a vast amount of literature has been produced on this topic. Urban sprawl, which is a process of uncoordinated suburbanization,<sup>1</sup> is considered to be an ineffective model of urban development, because resources are diverted away from the

central area toward new settlements on the periphery; such settlements are unsustainable and often lead to social segregation (BRUEGMANN, 2001). While in the Western countries, modern suburbanization began to occur massively after World War II, it started much latter in Central and Eastern European (CEE) countries that were under the communist regime for several decades. Although suburban development in the CEE countries was similar to that in the Western countries, it gained momentum very quickly in the CEE countries and was therefore under little control of urban planners from the outset. Moreover, suburbanization has been steadily intensifying since

<sup>1</sup> We use the terms “suburbanization” and “urban sprawl” interchangeably in this article.

the 1990s and the suburbs are an increasingly important component in settlement structures in the CEE countries. While the overall population in most of these countries is declining, the proportion of people living in the suburbs is increasing. It can be stated that the suburbs of major cities are currently the most attractive places to live in the CEE countries; It is noteworthy that the geography of cities of the Western countries has started to show a reverse pattern where centres are rich and suburbs are poor (VAN HAM ET AL., 2021). Suburban zones are often the places where various tensions, such as those related to social inequality and segregation, are likely to occur.

Like other CEE cities, Vilnius – the capital of Lithuania – is also undergoing fast suburbanization – a process which is associated with chaotic urban sprawl and rural-urban conversion (BRADE ET AL., 2009; CIRTAUTAS, 2013; UBAREVIČIENĖ ET AL., 2011). In addition, as in many other CEE countries, suburbanization takes place in the context of nationwide depopulation. What makes the suburbanization of Vilnius unusual is that the city is situated within a region where rural residents with a Polish identity<sup>2</sup> constitute the majority of the population. Such an ethnic landscape is the opposite of what can be found in many other European cities where the central city has a high share of ethnic minorities and where the commuter ring around the city is dominated by the titular ethnic group (UBAREVIČIENĖ ET AL., 2015). Previous research (BURNEIKA ET AL., 2013; UBAREVIČIENĖ ET AL., 2015) has shown that new suburban residents are mainly ethnic Lithuanians, thus suburbanization not only increases the size of the population in the region surrounding Vilnius, but also affects its ethnic structure. In addition, these new residents also differ in terms of income, education, and occupational status. As a consequence, suburbanization of Vilnius leads to a series of social, economic, cultural and morphological transformations. Incoming urban residents and the original rural population have different value systems, needs, worldviews and opportunities, thus diverse tensions may arise between them. This situation encourages us to gain more insight into the current processes of suburbanization and its spatial, as well as social, effects in the Vilnius metropolitan area (MA)<sup>3</sup>.

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<sup>2</sup> Between 1920 and 1939, the Vilnius region was part of the Polish State. This period showed a strong growth in the Polish population as well as a strengthening of the Polish identity of local residents throughout the Vilnius region (Stanaitis & Česnavičius, 2010).

<sup>3</sup> In this article, metropolitan area refers to the region consisting of the city municipality and its surrounding municipalities.

The aim of this article is to obtain more insight into the recent process of fast, but weakly controlled, residential suburbanization of Vilnius. The focus is on understanding the scale of suburbanization and its impact on the social and physical environment. This article reveals the forms that suburbanization has taken under the conditions of the weakly planned and controlled urban sprawl processes, which often take place on lands of a non-urban destination, and where the majority of new real estate developments are a result of private initiatives. In this study, we combine statistical data and cartographic techniques to explore the scale of suburbanization, and we present visual material from our field work to illustrate the changing morphology and physiognomy of the suburban areas in and around Vilnius. This is the first article, which uses building permit data at an individual-level and applies advanced geocoding techniques to analyse the suburbanization of Vilnius. The remainder of this article is structured as follows: In Section 2, we present how the overall residential patterns are changing in Lithuania and show that suburbanization plays an important role here. In Section 3 we describe the methodological framework of this study. In Section 4, we investigate the spatial expression of suburbanization and its impact on the social and physical environment. In Section 5, we provide the conclusions of our study, discuss the future of suburban areas in Vilnius, and give recommendations for further research.

## 2. Changing residential patterns in Lithuania

Lately Lithuania is often identified as one of the countries facing the most intense depopulation in the world (KIERZ, 2020; UNITED NATIONS, 2019). It is estimated that between 1990 and 2019 the population of Lithuania decreased by one quarter (in 2019 immigration surpassed emigration for the first time in three decades). The main reason for depopulation is emigration, which accounts for around 80% of the population decline in Lithuania over the past decades; the remainder is driven by a natural population decrease, which is most manifest in the eastern part of the country, serving as a hinterland of Vilnius (KRIAUČIŪNAS, 2018; DAUGIRDAS & POCIŪTĖ-SEREIKIENĖ, 2018). In Lithuania, a sharp population decline is followed by increasing socio-spatial inequalities (UBAREVIČIENĖ, 2017). The later process, besides the economic circumstances, is also determined by the legacy of Soviet planning policies, particularly those related to decentralised development strategies and the implementation of the polycentric urban system. While in Soviet times the uniform spread of the population and

economic activity was advocated, now economic growth and demographic potential are increasingly concentrated in a few MAs, particularly in Vilnius.

Fig. 1 shows that despite an overall population decline, a growing concentration of the population was observed in three MAs (Vilnius, Kaunas and Klaipėda) between 2001 and 2018 in Lithuania. The population dropped in the inner cities (except for Vilnius) and, in fact, their suburbs were the main areas where the population has been growing. The sprawl of the MAs, which started immediately after the 1990s, can be regarded as a consequence of Soviet planning. Like in many other Central and Eastern European cities, during Soviet times, the areas surrounding the largest cities in Lithuania were devoted exclusively to agriculture and associated industrial production (see, e.g., LEETMAA & TAMMARU, 2007; SÝKORA & OUŘEDNÍČEK, 2007; TAMMARU ET AL., 2009). The absence of private property and a real estate market contributed to the situation, with minor exceptions, until the 1990s, that residential suburbs did not exist (BERTAUD & RENAUD, 1997; KRIŠJĀNE & BĒRZIŅŠ, 2009; SÝKORA & ČERMÁK, 1998). After the collapse of the Soviet Union, the introduction of a free market economy, and privatization, liberated the previously constrained growth potential and allowed the cities to expand very quickly (CIRTAUTAS, 2013; UBAREVIČIENĖ ET AL., 2011). The attractiveness of suburban locations, in terms of natural environment and metropolitan potential (associated with jobs and services), drew growing numbers of people to the suburbs. In Lithuania, the process of suburbanization was

loosely regulated from the start and this led to uncontrolled urban sprawl of vast low-density residential areas into the previously rural regions surrounding the cities. Today the suburban zones can be characterised by scattered small-scale residential developments. The suburban settlements, or single houses of newcomers can be found interspersed in rural areas as far as 40 km from inner cities.

While the suburban areas of the three major Lithuanian cities account for a relatively small portion of the population (less than 10% of the total population in Lithuania in 2018), socioeconomically they are an important and an integral part of the urban system. Moreover, the suburbs are places to encounter two different societies: local rural residents and arriving urban lifestyle residents, and this can lead to tensions of various kinds. In Lithuania, suburban growth rates are unlikely to decline in the future, because the suburbs are the areas that many Lithuanians consider a priority when choosing a place to live (VERSLO ŽINIŲ, 2019). Given the country's extreme population decline, the need to take care of these areas with a growing population is even more pressing. It is obvious that the suburbs deserve special attention from policymakers and planners, however, they have not received it so far in Lithuania. One of the reasons for this is that spatial planning is mainly carried out at the municipal level, but the suburbs cover the territories of several municipalities, which, unfortunately, have little co-operation with each other, often even competing for tax payers, pupils or investments.

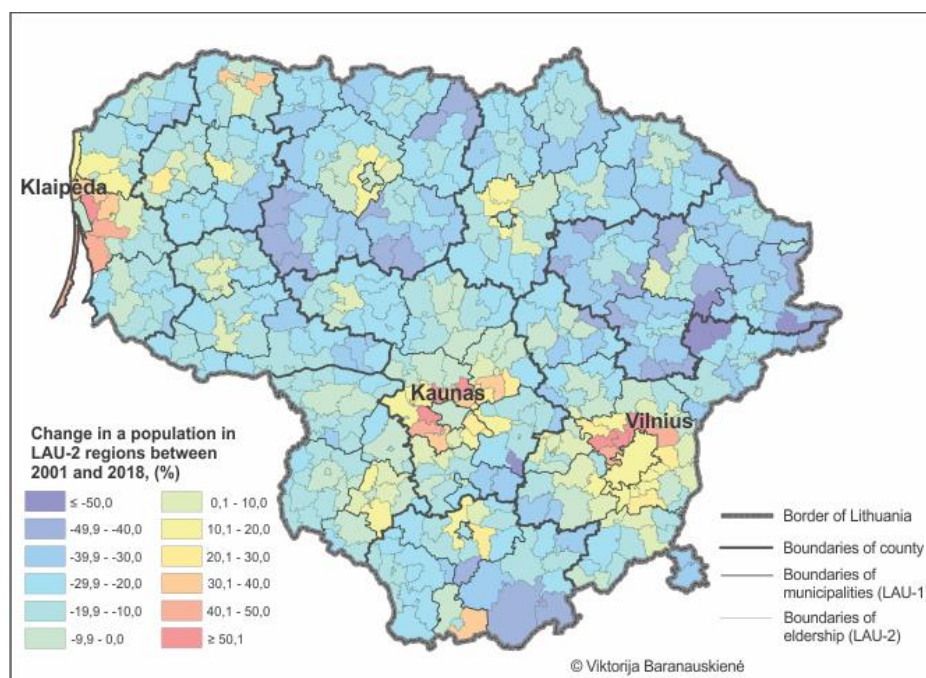


Fig. 1. Population change in Lithuania and sprawling metropolitan areas, 2001–2018 (Source: Created by V. Baranauskienė based on data from the Centre of Registers)

### 3. Methodological framework

In this study, we combined statistical data and cartographic techniques with visual material from our fieldwork. To explore the scale of suburbanization, we used building permit data.<sup>4</sup> We assumed that each building permit represented new construction and thus growth of suburbanization. This is the first study, which uses individual-level building permit data and applied advanced geocoding techniques to analyse the suburbanization of Vilnius. This approach enabled us to track the spatial expansion of the residential areas over the last decade at a very detailed spatial level. Upon our request, we received data on building permits that were issued between 2009<sup>5</sup> and 2019 (inclusive) in the Vilnius MA. The initial dataset contained around 20,000 building permits issued for detached and semi-detached family houses as well as apartment buildings along with their addresses. Before starting the analysis, we had to do some data screening and cleaning in order to refine the dataset. Firstly, different types of building permits (e.g., Permit to build a new building, Permit for reconstruction of the building, Written approval of the building project, Permit for renovation/modernization of the building, Permit to carry out major repairs of the building, etc.) can be given for a building registered under the same address. To avoid this overestimation, we left a single permit (the most recent) per address in our dataset. After this selection, the number of permits in our dataset decreased by approximately 2,000. Secondly, we also removed around 600 cases that did not have sufficiently precise addresses necessary for spatial analysis. Finally, when we geocoded the remaining addresses, 1400 addresses could not be identified (by OpenStreetMap and Google Maps), therefore these cases were also excluded from the analysis. Our final dataset included around 16,000 building permits, of which 94% were detached and semi-detached family houses and 6% apartment buildings; 44% of all permits were granted for constructions inside the Vilnius city municipality and the rest were granted for constructions in the region surrounding the city. We decided not to exclude the Vilnius city municipality from this analysis, and to plot all the

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<sup>4</sup> Building permit database is administered by Infostatyba. Infostatyba – information system for building permits and state supervision of construction in Lithuania, which is managed by the State spatial planning and construction inspectorate under the Ministry of the Environment. Website and e-database: <https://planuojstatyti.lt/info-portal/web/guest/>

<sup>5</sup> Data collection for the Vilnius MA started in 2009, and thus data for 2009 is incomplete.

building permits, because a lot of the suburban neighbourhoods are located inside the city municipality. This is also confirmed by the results in our maps. We did not treat detached and semi-detached family houses in the city centre as suburbanization, but such dwellings create distinctive suburban-style spaces in the city centre (see Fig. 4).

R statistical programming language and computing environment has been used to geocode the addresses associated with the building permits. By geocoding we mean that we first had to find out the geographical coordinates before we could create the maps of the building permits. Geocoding has been done using OpenStreetMap and Google Maps. To avoid inaccuracies when exact addresses were not specified in the dataset, instead of depicting each point (permit) on the map, we used grids of 1 km x 1 km and 2 km x 2 km to display building permits.

In this article, we also present visual material from our fieldwork to illustrate the impact of suburbanization on the social and physical environment as well as to illustrate the changing morphology and physiognomy of the suburban areas in and around Vilnius. In addition, this study used data from the 2001 and 2011 population censuses. Some of the reported figures were derived from aggregated-level data and others from individual-level data.

## 4. Results: suburbanization of Vilnius

### 4.1. Mapping the suburbanization of Vilnius

In this section, to gain a better understanding of the spatial expression of urban sprawl of Vilnius, we used building permit data and cartographic techniques. Fig. 2 shows the building permits granted each year for detached and semi-detached family houses. Despite the fact that the data for the first years (especially 2009) may not be complete, it is quite clear that until 2012 most of the building permits were issued in the peri-urban areas, and far less of them were issued within the city limits or in the nearby suburbs. Although suburbanization has been taking place around Vilnius since the end of the 1990s, the fact that it is not visible on the maps until 2012 can be explained by the Financial Crisis of 2008–2011, which had a major effect on the construction sector in Lithuania. The effect of the Crisis reduced in 2012, and thus construction intensified within the city limits and in the surrounding region. From 2013 until now the geography of building permits remains mainly the same every year. This means that the density of new construction (and hence the population) is increasing in certain settlements,

attracting higher income households, and thus leading to new forms of socio-spatial differentiation in the Vilnius MA. This process has taken place with little intervention from urban planners. In recent years, new residential

construction has often taken place in areas that, according to the Vilnius District Master Plan (VILNIAUS RAJONO SAVIVALDYBĖ, 2020) were intended for agriculture.

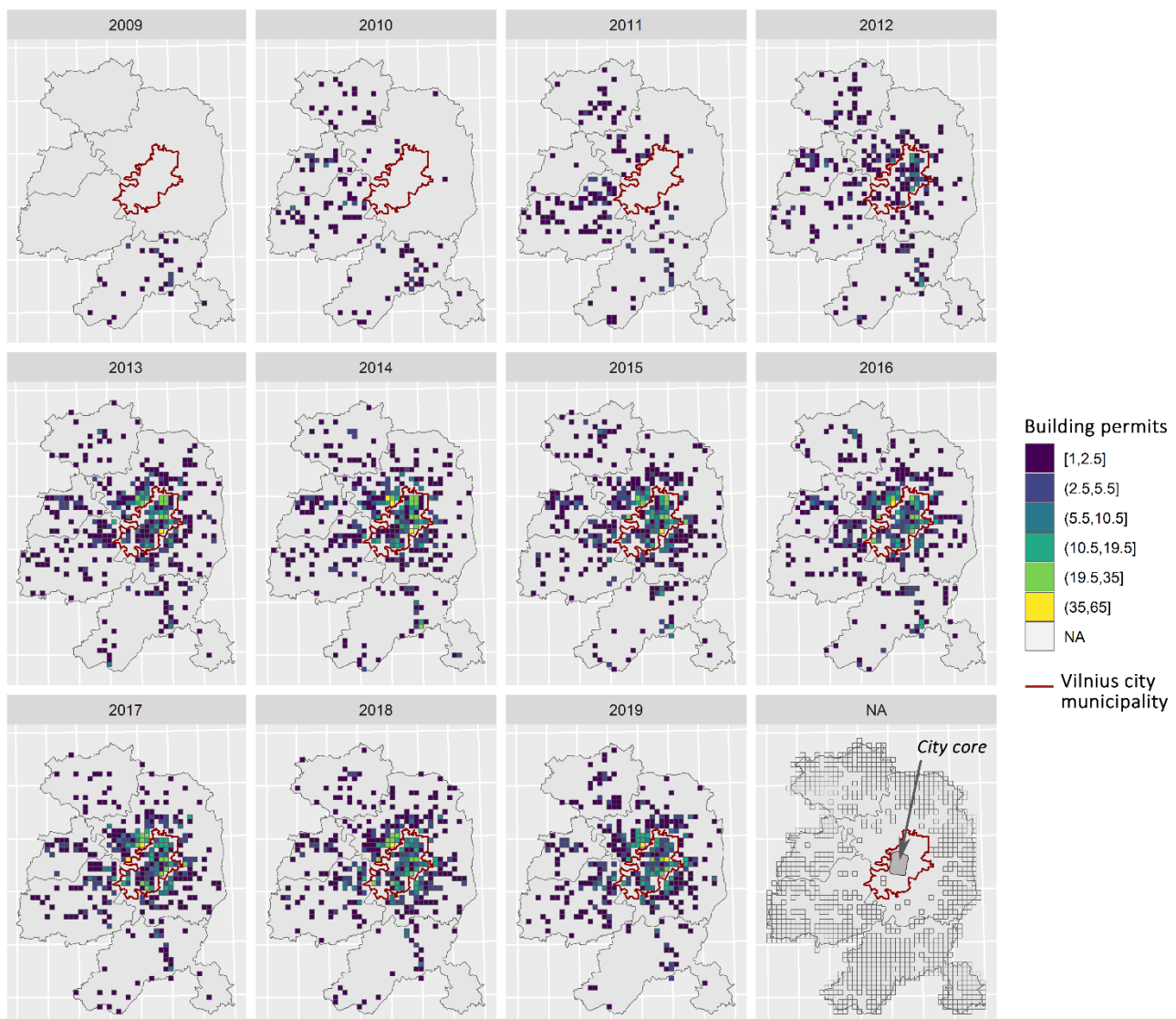


Fig. 2. The number of building permits issued in the Vilnius metropolitan area for detached and semi-detached family houses in 2009–2019; 2 km x 2 km grid (Source: own elaboration based on “Infostatyba” data)

Fig. 3 shows the same data for building permits for detached and semi-detached family houses, but here the data is grouped into four periods. Such data representation allows us to see the diffusion process on new residential housing, i.e. the evolution of suburban growth. Not surprisingly, the density of residential dwellings has been increasing significantly in certain areas. During the period 2009–2013, new residential housing formed a cluster on both sides of the city administrative boundary, and the density of new construction gradually decreased with distance from the city. A similar pattern of spatial diffusion of new settlements persisted, and it is likely that over time the entire metropolitan area will be

covered by a uniform network of suburban settlements. Over the past decade, more intensive suburban development has taken place to the north and west of the city. These are areas with a better connection to the city, better infrastructure, better land supply and, perhaps, better image. Although suburbanization has also taken place to the south and east of Vilnius, it was slower there; historically, these parts of the city have been more industry-oriented. Inside the city municipality, the most intensive development took place in the eastern and north-eastern parts of the city, where vast areas of collective gardens exist (see Fig. 6); The supply side factor plays a decisive role here, as

small (mostly 0.06-0.08 hectares in size) parcels of private land are unsuitable for apartment buildings. The density of new construction in more remote areas of the region is slowly but gradually increasing too, creating a dispersed residential landscape. However, it is difficult to assess whether residents of the Vilnius suburbs or local people (maybe even

engaged in agriculture) are settling there; most likely they are mixed. In general, the maps show intensive growth of Vilnius suburbs, which is quite impressive bearing in mind that this growth is taking place in a country, which has been rapidly losing its population for three decades.

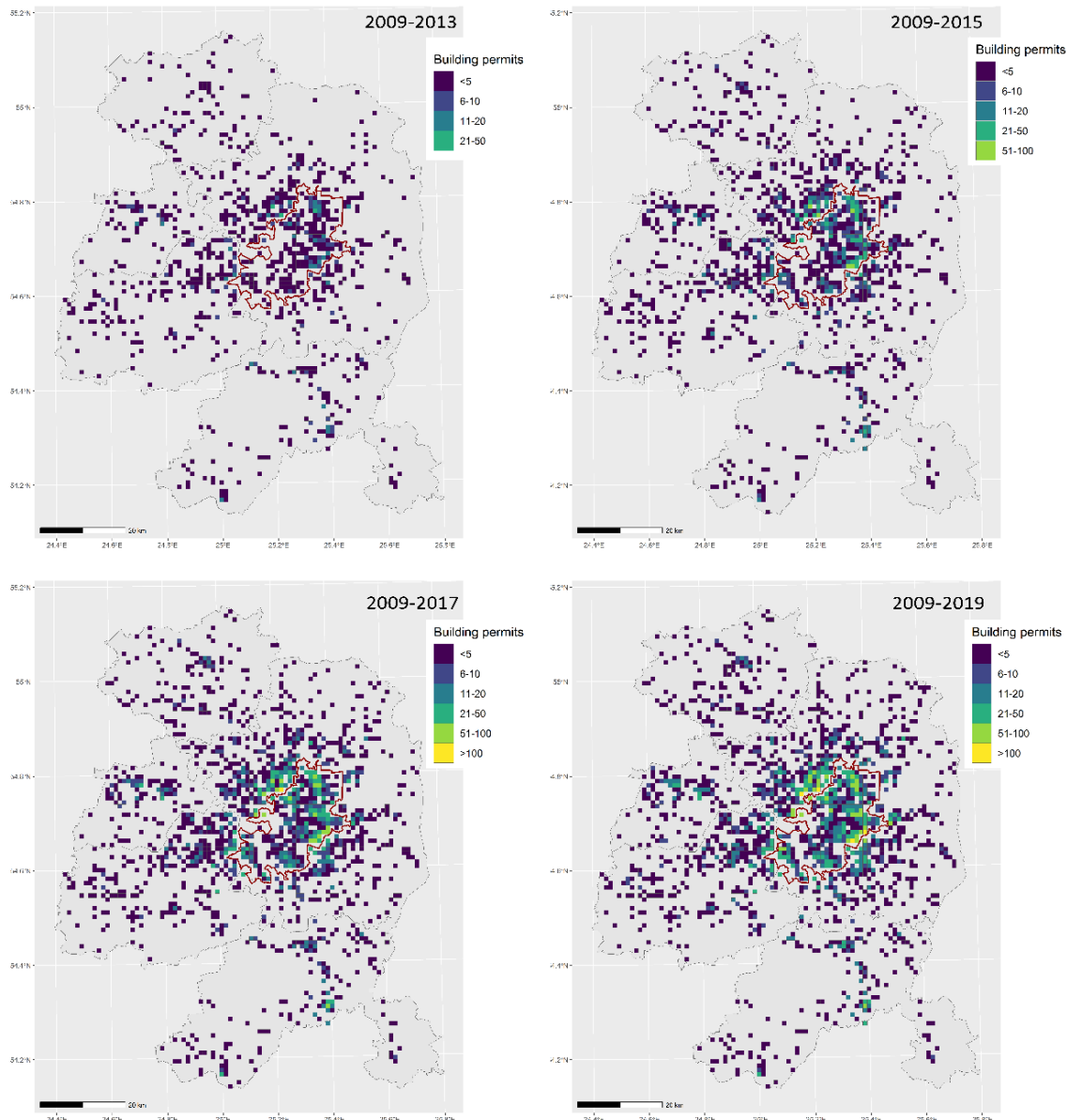


Fig. 3. The number of building permits issued in the Vilnius metropolitan area for detached and semi-detached family houses in 2009–2019, cumulative data; 1km X 1km grid (Source: own elaboration based on “Infostatyba” data)

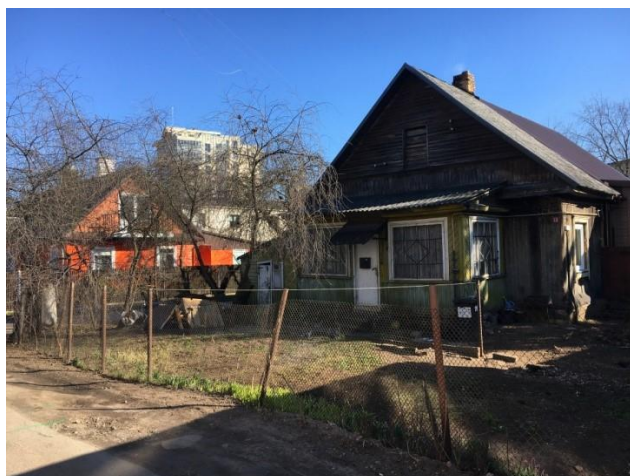
The results of our cartographic analysis confirm that the process of suburbanization in Vilnius disregards the administrative boundaries of the city: vast new suburban settlements, as well as single suburban-style dwellings, emerge within the city limits. It is noteworthy that at the end of the Soviet period Vilnius was not a compact city and was characterised by dispersed city limits. Since the 1950s its administrative boundaries have been significantly expanded to include areas

affected by extensive urban development, though it always contained some rural settlements too.<sup>6</sup> During the Soviet period, decisions to expand the city’s boundaries were made on the basis of urban development plans, but both during and after the Soviet period, the expansion of the city’s boundaries usually meant the acceptance of a new (unplanned)

<sup>6</sup> E.g., the size of the Vilnius city municipality was 104 km<sup>2</sup> in 1950, 260 km<sup>2</sup> in 1970, 287 km<sup>2</sup> in 1990 and 401 km<sup>2</sup> in 2000, when the last expansion took place (Česnavičius, 1999).

reality, rather than planning for future development (ČESNAVIČIUS 2009).

Between 2000 and now, the urban core (including extensive green areas) accounts for around 60% of the territory of the Vilnius city municipality. Apart from the suburban forests and waterbodies, the rest of the territory consists of agricultural, rural and semi-rural (i.e. collective gardens – *datchas*) areas – these are the areas of intense suburbanization; most often individual landowners change the land use destination of their small plots (0.06-0.08 hectares) from agricultural to residential, which results in a chaotic land ownership pattern and a chaotic landscape. The *datchas* (*Kleingarten* in Germany, *allotment garden* in Great Britain (GROENING, 2005)) are the most common type of suburbs within Vilnius city limits. According to previous research (SALADŽINSKAITĖ, 2016, p. 32-33), 61 complexes of collective gardens make up 5.5%



of the city's territory. They are very diverse nowadays: some plots are still used as gardens, others have been turned into residential houses (in the case of houses up to 80 sq. m land use destination change is not obligatory in Lithuania), some plots were amalgamated for more luxurious houses, while some remained unused. As a result, Vilnius is characterized by densely populated, small-scale and fragmented suburban-type neighbourhoods, located quite close to the city centre. Some rural-style dwellings and even small neighbourhoods (i.e. wooden houses with gardens and greenhouses) can be found very close to the city centre, illustrating that processes of rural-urban conversion are slow and spatially fragmented (Fig. 4. left). Even more extraordinary is the emergence of new individual houses, nestled among the multi-storey buildings in Soviet housing estates (Fig. 4 right).



Fig. 4. The remains of rural spaces (left) and newly-rebuilt detached houses (right) inside Žirmūnai Soviet housing estate, around 1,5–2 km from Vilnius Cathedral Square (Source: authors)

#### 4.2. Context and consequences of suburbanization

Since the 1990s the dominance of Vilnius has been increasing in the Lithuanian urban system, and it can now be regarded as an economic motor of the country. This can be illustrated by several figures that are also affected by suburban growth. For example, Vilnius city<sup>7</sup> received 70% of the total foreign direct investments in Lithuania in 2018 (STATISTICS LITHUANIA, 2019A), and 55% of all new dwellings were constructed in Vilnius county in 2019 (STATISTICS LITHUANIA, 2019B). According to data from the Population Register, 19% of the country's population inhabited Vilnius city, and 25% of all children under 18 years old lived here at the beginning of 2020 (CENTRE OF REGISTERS, 2020). Both of these numbers did not exceed 16% at the

end of the Soviet period. Between 2001 and 2018, the population of Vilnius city increased by 20% (or by 90 thousand) and by 36% in the suburbs surrounding the municipality (or by 27 thousand).<sup>8</sup> In the meantime, the total population of Lithuania dropped by 10% (or by 60.5 thousand), with the rural areas hit the hardest. It should be noted that Vilnius, which is located just 30 km from the Belarus border, is sprawling into one of the least economically developed and ethnically mixed regions of Lithuania. Thus, the influence of Vilnius city on the surrounding region is inevitable and multifaceted.

First, in Lithuania and in Vilnius the suburban areas (or at least most of them) are prestigious places to live, therefore it is mostly the higher socioeconomic status residents who move from the city to the suburbs. The average wage in Vilnius

<sup>7</sup> When we report statistical data, "Vilnius city" refers to "Vilnius city municipality".

<sup>8</sup> This statistic ignores the fact that a large share of the suburban developments are located inside the Vilnius city municipality.

city was 1.5–1.7 times higher than in the surrounding municipalities in 2001, when the process of suburbanization gained momentum (STATISTICS LITHUANIA, 2013). In 2019, the differences in wages between Vilnius city and the nearest municipalities decreased, however they remained at the same levels with the municipalities located slightly further away (STATISTICS LITHUANIA, 2020). Obviously, the income gap between the newcomers and the old residents had to be even greater. Moreover, employment rate and wages were growing faster in the municipalities surrounding the city than in the city itself (BURNEIKA & POCIUS, 2019). Thus, the region surrounding Vilnius, which was among the least affluent regions of Lithuania, has significantly strengthened within a few decades, and this was largely due to extensive urban growth.

The second important dimension of suburbanization is related to ethnic and cultural differences between the city and its surrounding region. Non-Lithuanians make up around 60% of the population of the region surrounding Vilnius city, while they make up only a third of the city's population. There are many reasons why the ethnic composition between the city and region is so different, but one of the primary ones is related to the post-war repatriation of Poles, who constitute the largest group of ethnic minorities in Lithuania, and particularly in the Vilnius region. 107 000 Poles (the majority of the city's population before the Second World War) left the city between 1945 and 1947 (CZERNIAKIEWICZ & CZERNIAKIEWICZ, 2007). Repatriation from the surrounding region was much smaller in scale (EBERHARDT, 2011). Therefore, the outward expansion of Vilnius became a significant driver of change in the ethnic composition in the region surrounding the city (UBAREVIČIENĖ ET AL., 2015). For example, between 2001 and 2011 the share of Lithuanians increased by 9 percentage points in the suburban areas and the share of Poles dropped correspondingly,<sup>9</sup> thus Lithuanians now make up the majority of the population in the suburbs close to Vilnius previously dominated by Poles. However, if we look at the census tract level, the share of Poles still exceeds 80% in the most peripheral parts of the Vilnius metropolitan region. The continuing process of suburbanization and the diffusion of new settlements deeper into the periphery means an increasing interaction between the original residents, many of whom

have a Polish identity, and newcomers, who are mainly of Lithuanian origin (UBAREVIČIENĖ ET AL., 2015). The coexistence of different groups with different needs, incomes, priorities, culture, worldviews, quality of life standards and value systems might cause some tensions (though this is not the subject of this article). The encounter of two different social groups is also reflected in the suburban landscape, as its fragmentation increases (e.g., how everyone handles their home environment).

One more important aspect related to suburbanization is the changing political landscape, where different social and ethnic groups support different political parties. Decisions related to spatial planning and regulation of new construction in the municipalities surrounding metropolitan cities can be influenced by two main factors. On the one hand, an inflow of wealthy residents increases incomes into the municipal budgets, but, on the other hand, these new residents change the balance of political power<sup>10</sup> (UBAREVIČIENĖ ET AL., 2015). This may be one of the reasons for uncoordinated and poor planning of suburbanization in Vilnius, but a separate investigation is needed to prove it. As we already mentioned, in Vilnius MA, new suburban settlements often appear in agricultural land, however, the planning of residential areas is prohibited in such land. One of the scenarios is when a private landlord divides agricultural fields of several hectares into small agricultural plots and sells them to dozens of households. The new owners fictitiously register agricultural activities, which allows them to build a “farm house” on the plot without changing its destination from agricultural to residential, which would be a complicated and lengthy process. As a result, such settlements adopt a chaotic shape and their infrastructure is often developed much later than the dwellings. Statistics illustrate the scale of this process. The number of farms per square kilometre was more than four times higher in the Vilnius district municipality compared to the Lithuanian average in 2016 (STATISTICS LITHUANIA, 2020).

Finally, urban sprawl means a gradual conversion from rural to urban areas. These are also areas where two different societies – urban and rural – come into a contact with each other on a daily basis. Usually these groups differ significantly according to their socio-economic background. The suburbanising population tends to be affluent, has an urban

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<sup>9</sup> In absolute numbers, the number of Lithuanians increased by 11,500, while the number of Poles decreased by 3,800 during 2001 and 2011. The decline in the Polish population is mainly due to an ageing population and thus a natural population decrease (the number of deaths exceeds the number of births).

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<sup>10</sup> The support for the Lithuanian Polish election action party in Vilnius district municipality fell from 64,7% in 2011, 60,8% in 2015 to 53,5% in 2019 (Lietuvos respublikos vyriausioji rinkimų komisija, 2020).



lifestyle and strong links with the city (through work, education, cultural events, etc.). Moreover, those who recently settled in the region have a weaker local identity and are less concerned about local issues, events or politics (UBAREVIČIENĖ ET AL., 2015). Although social diversity is generally seen as an asset and is encouraged, the development of integrated communities is hardly possible when the worldviews and interests of the population are significantly different, and few unifying factors, other than location, exist.

All the above-mentioned consequences of urban sprawl have a footprint in the morphology of suburban areas and the physiognomy of buildings. The region surrounding Vilnius was historically dominated by ethnic Polish residents, agricultural activities, and traditional wooden architecture. During the Soviet period, the rural landscape was diversified with Soviet standardized single family and low-rise rural apartment houses as well as some industrial objects. All of these did not have the most appealing design. Many of those spaces still exist in Vilnius, even in its central location. Some of them were rebuilt, creating islands of suburban lifestyle within the Soviet housing estates. The newest residential construction, that started after the 1990s, varies greatly according to the materials used, size and style. It is also accompanied by new infrastructure. In addition, shopping centres, factories and logistics companies are being established in places where the infrastructure is well developed. All historical periods and types of dwellings are mixed in the region surrounding Vilnius, creating a rather chaotic landscape, with little interference from urban planners and no clear vision for the future.

#### 4.3. Rural-urban conversion: visual evidence

Today the suburbs of Vilnius do not have one typical character. This is determined both by natural conditions and social environment. The Vilnius MA is located in the area where the last glacier stopped, thus it is divided by a glacial river valley. Slopes that are unsuitable for construction are overgrown with forests and have the status of Regional Park, so new construction is very limited. Such a landscape contributes to the dispersal of residential areas, drawing them further away from the city to the agricultural plains or into existing settlements. In the agricultural plains, the supply of available land plots for new residential construction often depends on the ability of landowners to subdivide their property into smaller plots. As for the existing settlements, new dwellings often emerge in-between the old ones, thus producing a collage of historical

periods. There is also a wide variety of architectural styles (in terms of the size of houses, materials used, etc.) that can be found in and around Vilnius in all directions. Most suburban houses are built privately, and their architecture is little regulated by law, thus each house acquires a unique style according to the wishes and capabilities of its owner. In addition, the socio-demographic structure of the residents is very diverse, and people from very different social backgrounds often live side by side. All of this creates an irregular and often chaotic morphology to the suburbs of Vilnius.

We have tried to distinguish the most typical forms of suburban developments in and around Vilnius, which, of course, have many distinctive features depending on the particular neighbourhoods. Generally, new suburban developments can be divided into two major categories. The first category includes suburbs that have been planned and developed by investors. They consist of multiple dwellings with a shared infrastructure. This can be a group of individual houses or semi-detached houses, or even larger apartment buildings (Fig. 5, left). The second major category includes private developments, where single house projects dominate, and the infrastructure usually comes much later (Fig. 5, right). Based on our field studies, the second category dominates. This is the main reason why the suburbs of Vilnius are characterized by a visually chaotic mix of housing of various sizes, styles and densities. What is also noticeable, is that there are quite a few homes whose construction stopped ten or more years ago, and it does not seem that the construction will be restarted any time soon (especially with the new economic crisis). Such unregulated spatial development results in increasing pressure on the environment, growing transportation costs, decreasing quality of landscape as well as creating the impression that the present society lives without spatial planning.

In terms of location, we can distinguish three types of suburban dwellings: 1) dwellings that appear in empty (residential) areas, most often in agricultural land (e.g., Fig. 5 and Fig. 8); 2) dwellings that appear next to older dwellings and can therefore benefit from already developed infrastructure; 3) dwellings that appear on the site of former buildings; e.g., in the collective gardens or villages (Fig. 6).

Most widespread and numerous are suburban developments which appear in the areas of collective gardens, especially within the city limits, where the supply of land is very limited (the most distant collective gardens are located some 30 km from city centre). Since the early 1990s, summer-house type buildings (cabins) have been totally replaced by residential houses in the oldest and most centrally

located collective gardens. While the most remote gardens today are used for both living and recreation (Fig. 6).

Suburbs also differ greatly depending on their period of construction. Huge single-family houses built closer to the city core were common in the early 1990s. At present, smaller and economically much more efficient, often one storey buildings dominate in the more distant suburbs (Fig. 7).

The density of the suburban population (i.e., how far apart the suburban houses are) also varies. Semi-detached houses with small gardens and former *datcha* areas inside the city limits are the most densely built up. Meanwhile the most distant developments appear as farmstead type settlements, often with their own ponds and “sauna houses” (Fig. 8).



Fig. 5. Multi-dwelling investment project (left) and private led construction (right) in suburban areas (Source: authors)



Fig. 6. Transformation of the collective gardens into residential neighbourhoods (Source: authors)



Fig. 7. Suburban houses built in the 1990s within the city municipality (left) and the most recent developments outside the city (right) (Source: authors)



Fig. 8. Suburban dwellings sparsely distributed in agricultural land (Source: authors)

## 5. Discussion and conclusions

While Lithuania has experienced extreme population decline, the metropolitan area of Vilnius has faced a contrasting trend of population growth, especially in suburban areas. The aim of this article was to obtain more insight into the recent process of fast, but weakly controlled, residential suburbanization of Vilnius. Our analysis, where we used individual-level building permit data and applied geocoding techniques to track the spatial expansion of the residential areas, showed that the recent suburbanization is very dispersed and is scattered throughout the metropolitan area of Vilnius. Since 1990, the pace of suburbanization has been gradually increasing, and, although suburban sprawl is vulnerable to economic downturns, the impact of the financial crisis of 2008–2011 was short-lasting and suburbanization soon gained momentum again. A current crisis, triggered by a global pandemic, is likely to slow down the growth of the suburbs again, however, the nature of further suburban development will depend on the willingness and ability of urban planners to intervene in the processes of urban sprawl.

The suburbs of Vilnius are places where different people come together: rural lifestyle-led and urban lifestyle-led, wealthy and poor, and those having different ethnicity and different political preferences. Unsurprisingly, socially mixed areas have visually mixed landscapes of ambiguous attractiveness. Therefore, intensive and uncoordinated suburbanization can cause social and spatial tensions that emerge when the new residents settle next to the old ones. New developments rarely replace the older residential structures entirely, thus rural, urban, and suburban spaces coexist in the metropolitan area of Vilnius. Some villages have remained untouched by urban sprawl in the

outskirts of the city. Even in the city centre, the rural spaces have withstood urban pressure for more than 100 years.

Visual material from our field work has revealed a great diversity of suburban areas as well as their changing morphology and physiognomy in and around Vilnius. It is easy to notice that the suburbanization of Vilnius has taken place with little interference from urban planners and no clear vision for the future. Investors often play the role of planners. As a result, different land-use patterns and building styles are mixed, creating chaotic landscape. It is beyond our scope to judge whether the changes brought by recent suburbanization are positive or negative in terms of their visual impact. However, uncoordinated and unplanned urban sprawl is undesirable in many aspects. New developments often lack essential infrastructure and public services (i.e. schools and kindergartens, water supplying and treatment systems, etc.). Urban sprawl also challenges existing infrastructure and its maintenance, e.g., public transport cannot serve distant suburbs and encourages people to use private transport, and thus a vicious circle is formed.

Suburbs are the only areas where the population has grown in recent decades, and thus deserve special attention and planning; much different from the rest of Lithuania. However, the suburbs seem to have been forgotten even in statistical yearbooks, where most of them are described as rural areas. One of the major issues is that the Lithuanian administrative system has only one municipal level with a strong spatial planning power. Planning, based on such an administrative system, does not create conditions for the integrated development of metropolitan areas, located across several municipalities where there is little cooperation between municipalities and no shared

vision for their future development. Moreover, Lithuanian municipalities are among the biggest in the EU and there is no lower-level self-government, therefore the needs of local communities may go unnoticed. Suburban development issues need to be brought to the attention of policy makers, who should make amendments to the country's spatial planning processes. We believe that most of the problems associated with suburban development will remain unless regional level planning is strengthened.

An upcoming slowdown (related to the global pandemic) in suburban growth, could provide a chance to rethink the urban development strategy, but it is very likely that increased attention on the healthcare system and other "urgent" matters will push these problems aside for "better times". If no steps are taken and no solutions implemented to systematically address the chaotic and uncoordinated urban sprawl, we foresee that the process of suburbanization will remain chaotic, based on private initiatives, and will continue to create rather distinctive, fragmented and mixed suburban landscapes. This development will mainly take place on agricultural land with former settlements, and the combination of rural and urban space as well as lifestyle will remain a distinctive feature of the metropolitan area of Vilnius. In the long term, new suburban settlements and single dwellings are likely to penetrate deeper into rural areas, but the density of already existing suburban spaces will also increase. If, however, planning measures are taken, it does not mean that they need to stop the growth of new suburbs. These measures should coordinate the suburbanization process, take into consideration the interests of all residents, and ensure that the development of infrastructure and public services goes hand in hand with population change.

We can only speculate what would have been the consequences for the socio-spatial organization of the Central and Eastern European countries, including Lithuania, if the growth of the suburbs had been restricted since the 1990s. What residence alternatives would "suburbanizers" have chosen? Would this have reduced the level of segregation that is on the rise in many European cities (TAMMARU ET AL. 2016)? And whether suburbanization was necessary for the capital regions to grow and thrive? This could be a concern for researchers and urbanists dealing with the spatial development of these post-socialist countries. In Vilnius, more research is needed to uncover the effects of suburbanization on rural communities. Obviously, the process has both positive and negative consequences, but it is highly dependent on the

person or community. The future of these new mixed spaces will depend on the ability to balance their needs and to develop collaborative relationships between diverse communities and different municipalities.

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