

FACTORS AFFECTING AND DETERMINING LOCAL DEPOPULATION

Faktori, kas ietekmē un nosaka iedzīvotāju skaita lokālo pieaugumu un samazinājumu

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Abstract. This paper analyses the factors that influence and determine the local population growth and decrease in rural areas of Latvia based on population changes at micro level (1x1 km square grid areas) in 2000–2018. Quantitative analysis of the spatial structure of the population was carried out in three reference territories. Results suggest that the proportion of territories with population increase in Latvian municipalities (2000–2018) has a very strong and statistically significant correlation to population changes (2000–2018) in the respective municipality. This may lead to the conclusion that the influence of other factors on the location of the territories in the spatial structure of the municipality where population growth is observed is not statistically significant.

Keywords: *population geography, population changes, spatial population structure*

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Introduction

Population shrinkage is a significant problem for Latvia. The main cause of population decrease in Latvia is migration. Migration and its influencing factors are an important area of research in population geography (Bērziņš et al. 2018). The territorial disparities of migration have received the attention of many researchers in Latvia (e.g. Krisjane et al. 2017; Zhitin et al. 2018; Arbidane & Markevica 2016; Göler et al. 2014; Apsite et al. 2012; Krisjane & Berzins 2012) and in the European context (Poot et al. 2008; Hazans 2003; Champion 2008). Migration is influenced by the income gap between economically developed and less developed regions (Harris & Todaro 1970; Greenwood & Hunt 2003; Boyle et al. 1998), agricultural production efficiency and development (Camaioni et al. 2019; Clark et al. 1997; Chomy et al. 2011; Brodzinski 2007), sustainable forestry and rural area development (Yilmaz et al. 2010; Smallbone 2009) and economic benefit for individuals (Sjaastad 1962).

For example, by researching the key factors affecting rural development in Turkey, 12 key factors affecting village development were identified: geographical location, village size, land productivity, land use, active population, poplar production areas, proximity to a river, housing comfort, drinking water characteristics, fertility of the land, cooperation and investment in social infrastructure (Oddershede et al. 2007). The process of studying rural development must use both objective and subjective data, including the views of local leaders (Straka & Tuzova 2016).

Latvia is a country with a high proportion of rural areas: Vidzeme, Latgale and Zemgale are considered rural regions, Kurzeme a transition region, and Pierīga an urban region (Zobena & Ijabs 2015). Latvia is characterised not only by negative long-term net migration, but also by low birth rates and increased life expectancy (Eglīte et al. 2003; Zvidriņš 2006). Internal migration rates in Latvia change from year to year, but on average they reach 2% of the total population of the country (Bērziņš 2011). Tourism and agricultural processing, as well as business services (Vēveris et al. 2007) and ecosystem services (Ozoliņš et al. 2015), are becoming important drivers of the economic development of rural areas.

The aim of the study was to identify the factors that influence and determine local population change in rural areas of Latvia.

Data and methods

The data of the Central Statistical Bureau of Latvia (CSB) on population changes were used in the course of the work. For detailed map comparisons, 6th cycle orthophoto maps, topographic maps, soil maps and CSB maps were used. For the analysis of the spatial structure of the population of the municipalities, a square grid which divides Latvia into 1x1 km squares was used. For each municipality included in the study, only those squares which are mostly within the territory of the municipality were counted.

Cartographic software (ESRI ArcGIS) was used to visualise the results of the work and to prepare the images.

Results

According to the results obtained during the research, no statistically significant set of parameters (soil type or fertility, distance to a road, distance to the nearest city, etc.) was identified in relation to population changes at the micro level (1x1 km square grid areas). Observations in several regions (Skriveri, Ozolnieki, Jelgava, Olaine, etc.) did not reveal any identifiable correlations that would allow for generalising about the causes of small population changes in settlements.

In the further course of the work, quantitative analysis of the spatial structure of the population was carried out in three reference territories. Dagda, Aglona and Kraslava municipalities (Figure 1) were selected as territories with significant population decline in 2000–2018. Aizkraukle and Skriveri municipalities were selected as areas with average population decline and Kekava, Salaspils and Stopini municipalities were selected as areas with population increase.

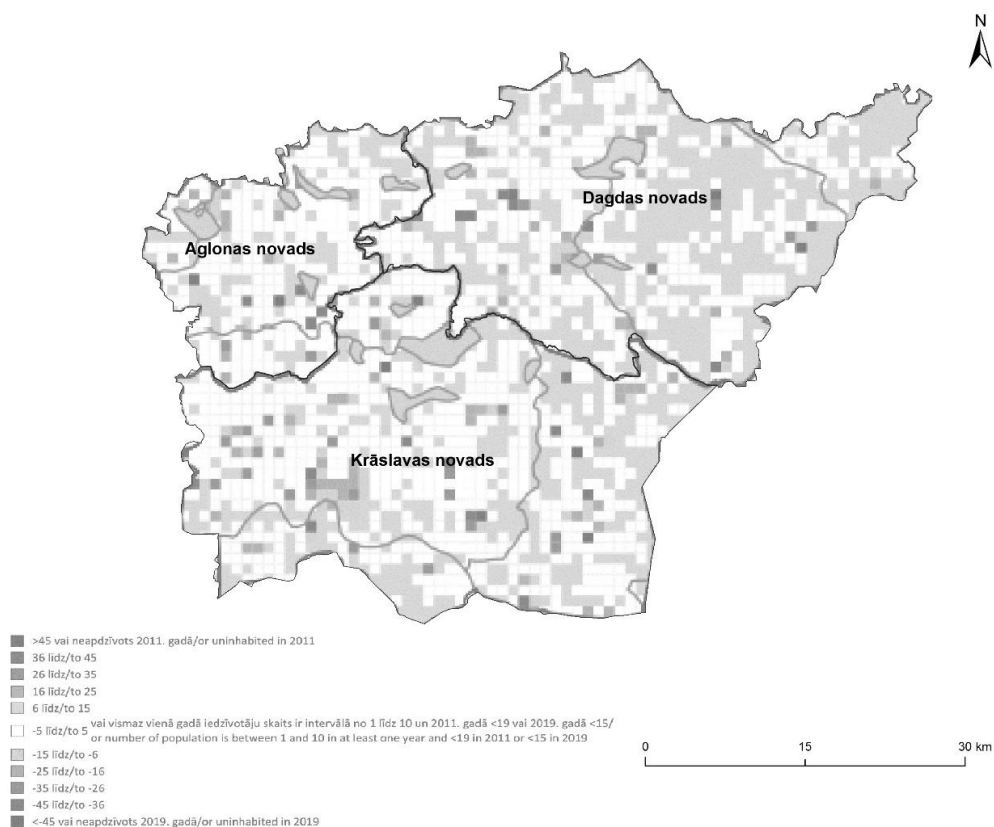


Figure 1. Population changes in 1x1 km square grid areas between 2000 and 2018 in Dagda, Aglona and Kraslava municipalities (authors' figure based on CSB data)

In Dagda, Aglona and Kraslava municipalities (Figure 1), approximately 30 to 50% of the surveyed area is uninhabited (forests, swamps, etc.). Only about one-tenth of the area experienced population decline. This happened mainly in areas with high population density.

Comparing the changes in the spatial structure of the population in municipalities with a significant decrease in the population, the following results were obtained: between 2000 and 2018 the population of Dagda municipality decreased by 40.4%, and the population increased only in 1.4% of the populated area; in Aglona municipality these rates are -37.4% and 1.6% respectively; and in Kraslava municipality -35.5% and 2.0% respectively (Table 1).

Table 1. Population changes between 2000 and 2018 and changes in the spatial structure of the population in 1x1 km square grid areas between 2000 and 2018 in Dagda, Aglona and Kraslava municipalities (based on CSB data)

Statistical characteristic	Aglona municipality	Dagda municipality	Kraslava municipality
Population at the beginning of 2000	5549	11178	22900
Population at the beginning of 2018	3309	6992	14542
Population changes 2018/2000 (%)	-40.37	-37.45	-36.50
Number of spatial squares	386	953	1101

Statistical characteristic	Aglona municipality	Dagda municipality	Kraslava municipality
Number of spatial squares without population	99	452	351
Number of spatial squares with population	287	501	750
The number of spatial squares in which the population increased	4	8	15
The number of spatial squares in which the population decreased	33	67	97
The percentage of populated spatial squares in which the population increased	1.39	1.60	2.00
The percentage of populated spatial squares in which the population decreased	11.50	13.37	12.93

In Aizkraukle and Skrīveri municipalities, 30–50% of the study area is uninhabited (forests, swamps, etc.), but in about a quarter of the area the population has decreased. This happened mainly in areas with high population density. In about one-tenth of the area the population increased.

Comparing the changes in the spatial structure of the population in the municipalities with an average decrease in population, the following results were obtained: the population of Aizkraukle municipality decreased by 21.9% between 2000 and 2018, while in 20.8% of the populated area the population increased; in Skrīveri municipality these rates were -17.3% and 8.7% respectively (Table 2).

Table 2. Population changes and changes in the spatial structure of the population in 1x1 km square grid areas between 2000 and 2018 in Aizkraukle and Skrīveri municipalities (based on CSB data)

Statistical characteristic	Aizkraukle municipality	Skrīveri municipality
Population at the beginning of 2000	10414	4082
Population at the beginning of 2018	8130	3366
Population changes 2018/2000 (%)	-21.93	-17.54
Number of spatial squares	100	102
Number of spatial squares without population	47	33
Number of spatial squares with population	53	69
The number of spatial squares in which the population increased	11	6
The number of spatial squares in which the population decreased	13	18
The percentage of populated spatial squares in which the population increased	20.75	8.70
The percentage of populated spatial squares in which the population decreased	24.53	26.09

In Kekava, Salaspils and Stopini municipalities, most of the area is populated (i.e., almost all spatial squares in Stopini municipality). The population of these municipalities has increased in most areas. Comparing the changes in the spatial structure of the population in the municipalities with the population increase, the following results were obtained. Between 2000 and 2018 the population of Kekava municipality increased by 46.2% and the population increased in 47.3% of the populated area. In Stopini municipality these rates are 51.1% and 52.1%, while in Salaspils they are - 5.3% and 45.7% respectively (Table 3).

Table 3. Population changes between 2000 and 2018 and changes in the spatial structure of the population in 1x1 km square grid areas between 2000 and 2018 in Kekava, Salaspils and Stopini municipalities (based on CSB data)

Statistical characteristic	Kekava municipality	Salaspils municipality	Stopini municipality
Population at the beginning of 2000	15762	21425	6942
Population at the beginning of 2018	23042	22555	10492
Population changes 2018/2000 (%)	46.18703	5.274212	51.138
Number of spatial squares	270	122	49
Number of spatial squares without population	103	30	1
Number of spatial squares with population	167	92	48
The number of spatial squares in which the population increased	79	42	25
The number of spatial squares in which the population decreased	23	13	6
The percentage of populated spatial squares in which the population increased	47.31	45.65	52.08
The percentage of populated spatial squares in which the population decreased	13.77	14.13	12.50

Conclusion

Internal migration analysis at the regional level indicate that the desire to improve quality of life is the main motive behind the change of residence.

From the obtained results of the spatial structure analysis of the population in the reference territories, it could be hypothesised that the proportion of territories with population increase in Latvian municipalities (2000–2018) has a very strong and statistically significant correlation to population changes (2000–2018) in the respective municipality.

This may lead to the conclusion that the influence of other factors on the location of the territories in the spatial structure of the municipality where population growth is observed is not statistically significant.

Kopsavilkums

Rakstā analizēti faktori, kas ietekmē un nosaka vietējo iedzīvotāju skaita pieaugumu un samazināšanos Latvijas lauku novados, pamatojoties uz iedzīvotāju skaita pārmaiņām mikrolīmenī – analizējot regulāra režģa 1x1 km tīkla pārklājumu 2000. - 2018. gadā. Iedzīvotāju telpiskās struktūras kvantitatīvā analīze tika veikta trīs etalonteritorijās. Rezultāti liecina, ka teritoriju īpatsvaram ar iedzīvotāju skaita pieaugumu Latvijas novados (2000–2018) ir statistiski nozīmīga korelācija ar iedzīvotāju skaita pārmaiņām (2000–2018) attiecīgajā novadā. Autori tālākiem pētījumiem izvirza hipotēzi, ka citu faktoru ietekme uz teritoriju izvietojumu pašvaldības telpiskajā struktūrā, kurā tiek novērota iedzīvotāju skaita palielināšanās, varētu nebūt statistiski nozīmīga.

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