

## INVESTIGATIONS ON THE STRUCTURE OF RURAL INHABITED LOCALITIES

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### Summary

The article analyses the dislocation and changes of rural inhabited localities in Lithuanian administrative territories. 247 small towns and about 18 thousand villages are attributed to rural inhabited localities. During the Soviet period, central settlements of collective farms (into which inhabitants from liquidated individual farmsteads had been moved) were among the most rapidly growing ones. The formed large settlements can be considered as the safeguard for the stability of the rural population system, because they serve other rural inhabitants as well. There were 2374 settlements with more than 100 inhabitants in them in Lithuania in 2001. However, rural inhabitants are distributed unevenly by administrative territories: the highest density of inhabitants is measured in suburban regions as well as in southern and southeastern Lithuania, the lowest density of inhabitants – in northern and north-eastern regions of Lithuania. Correspondingly, large settlements are distributed unevenly by the area of agricultural land. In the identified problematic territories, it is necessary to regulate the decrease of rural population with the help of economical and organizational measures while creating better conditions for the work and life quality of people. Without the significant state support, the further disappearance of villages and the decrease of the number of inhabitants in eight districts of our country can have negative impact upon the land use, the growth of the agricultural production and the rural development on the whole.

**Keywords:** rural inhabited locality, agricultural land, land use, inhabitants.

### Introduction

The structure of the Lithuanian rural inhabited localities consists of historically arisen dislocation of the villages (as territorial units with inhabited farmsteads) of various sizes. Villages have their own historical boundaries – „borders“, the change of which in the interwar Lithuania was regulated by the Law on Land management. At present, they are cartographed in the map of the Register of inhabited localities of the Republic of Lithuania managed by the State Enterprise Centre of Registers and are used for the determination of the addresses of land plots. According to the data of the population census of 1923 villages and other rural inhabited localities were distributed into the following categories: small town, village with a church, village, estate, *palivarkas*, steading, individual farm, settlement. In the territorial planning documents prepared after the World War II, Lithuanian rural inhabited localities were distributed into settlements (subject to functions – central, subsidiary or non-expanded), villages (categorizing in some places into scattered, stooky, street and steading villages) and individual farms. In present laws (Lietuvos..., 1994), small towns and villages are attributed to the rural inhabited localities. Small towns are called compactly built up inhabited localities with the population ranging from 500 up to 3000 inhabitants, of which more than half work in industrial enterprises, fields of business, production and social facilities. Villages are called other inhabited localities having no features characteristic to towns and small towns.

There were 274 small towns in the territory of present Lithuania in 1923. At present, there are 247 small towns. In 2001, in 14 of these traditional small towns lived 80–200 people, in 88 lived 201–500 people and only in the rest 145 small towns lived more than 500 people. However, 110 former villages (apart from suburban ones) have already grown into small towns with a population of 501–2000. The total number of rural inhabited localities has decreased from 25143 to 18459 (26.6 percent) during the period of 1959–2001 (inhabitants vanished or villages were incorporated into the boundaries of towns). The number of rural inhabitants has decreased from 1674.6 to 1151.1 thousand (31.3 percent) during the same period. Since 2001, about 100 of small villages on the average disappear in Lithuania every year. These tendencies can have negative impact on the economic and social condition of our country. *The objective* of the carried out analysis of the structure of rural inhabited localities is to determine the changes of rural inhabited localities and demand for their regulation by state with the help of legal, economical and organizational measures. The following *tasks* are raised for the achievement of the objective:

- to carry out the zoning of the administrative territories of the country on the basis of analysis according to the intensity of occurring demographic changes;

- to determine the changes (and their reasons) of large settlements – attraction centres;
- to prepare suggestions over the rural development problems to be solved in separate regions of the country.

The data of the Department of Statistics over the number of rural inhabitants, the data of the population census (carried out in 1989 and 2001) according to the administrative localities and villages, the data of the investigation on inhabited localities and the assessment of individual farms (carried out by the State Land Management Institute in 1984–1985), statistical data over the composition of the land fund declared by the State Enterprise Centre of Registers and the National Land Service under the Ministry of Agriculture of the Republic of Lithuania, legal acts regulating the construction of farmsteads in rural localities, measures of the Lithuanian rural development program for 2007–2013 connected with the support for the subjects of agricultural activity as well as their implementation indices were used for the investigations. Investigations supplement conclusions of earlier investigations carried out by the author (Aleknavičius, 2006; 2007; 2010).

*Methods of investigations* – literature analysis, cartographic material analysis and mathematical statistical.

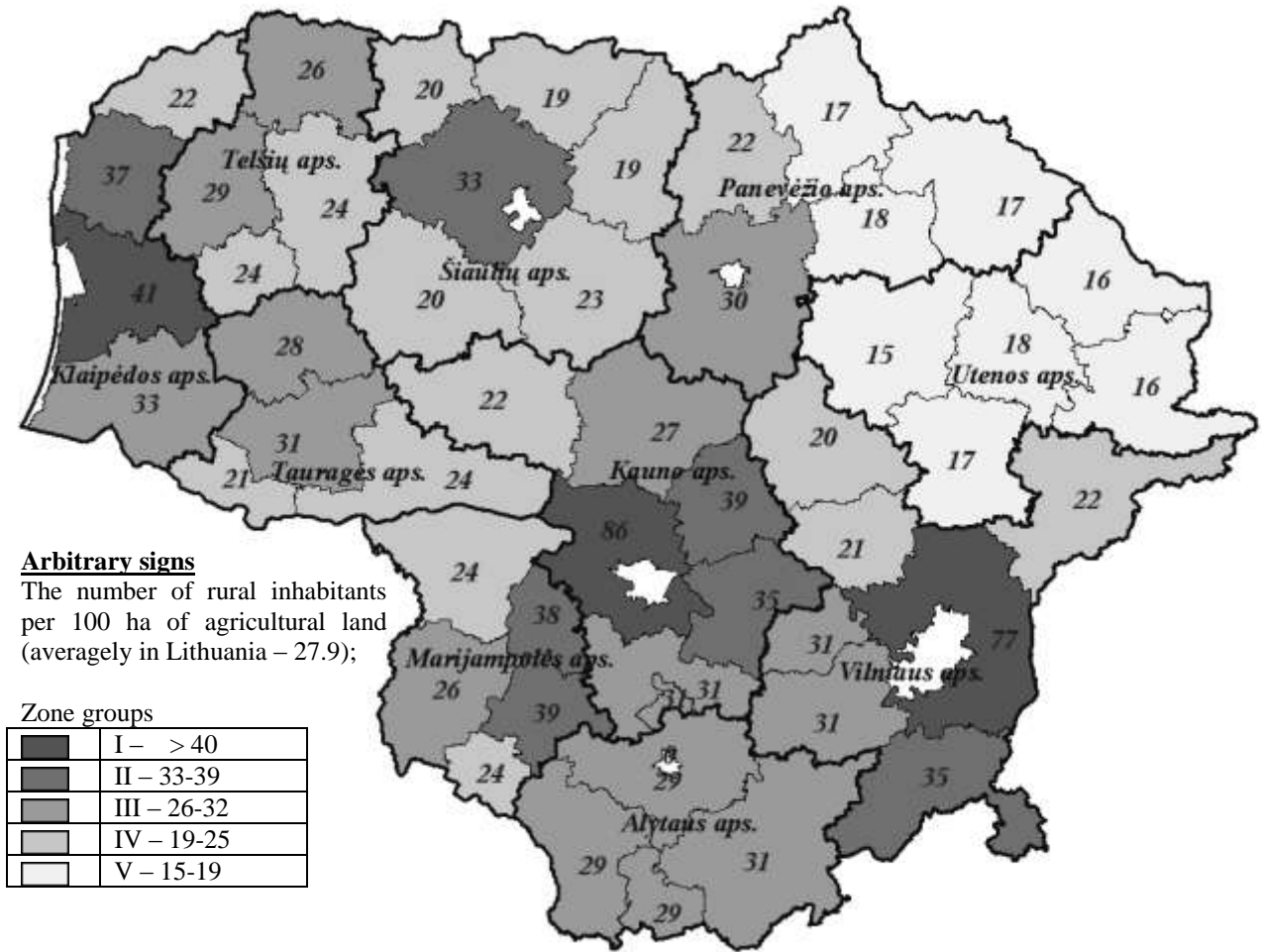
### ***Results of investigations***

Analysis of the dislocation of villages allows stating that the system of rural inhabited localities has formed in Lithuania, in which the objects with higher hierarchy level, such as small towns and large, compactly built up villages, cleared out as well as smaller villages included into the service zones of small towns and large villages. It is the result of the rural settlement formation policy carried out in soviet times. The new construction of dwelling houses (financed by farms or physical persons) was possible only in perspective settlements of farms. The viability of settlements used to be determined by the functions of the settlements in serving the activity of agricultural enterprises and production objects which were determined on the basis of internal land management projects of farms in agricultural planning schemes of districts. Every farm (the average area of which made up 3–4 thousand ha) and its territorial subdivision had to have one perspective settlement. Therefore, the network of such settlements was rather even in the land designated for agricultural purposes. Smaller villages started to disappear not only due to the restrictions over the construction of new structures in them or due to the migration of younger generation to towns, but due to the moving of individual farms (when carrying out large-scale land reclamation works) as well. However, during the moving of individual farms, farmsteads with good quality constructions and plantations or those situated near large settlements, production centres and recreational objects were preserved. Formation of the system of stable rural settlements and the established enterprises providing services and cultural facilities for inhabitants of these settlements had positive impact upon the migration of rural population. The significant part of people (from the moved individual farms) moved not to towns, but to the neighbourhood settlements, where they built their farmsteads. In turn, it stimulated the growth of large settlements. Following the investigations<sup>1</sup> carried out as far back as 1987, it was defined that in central and expanding farm settlements (the total number of which was 1475) the average number of inhabitants has increased by 38–40 percent during the period of 1974–1985. At present, the development of Lithuanian towns and rural inhabited localities is regulated by the general (master) plan of the territory of the Republic of Lithuania (Lietuvos..., 2002) and general (master) plans of the territories of municipalities, the order and the principles of the preparation of which are presented in the instructions approved by the Minister of Environment (Aplinkos..., 2004).

This article analysis the system of rural inhabited localities from the viewpoint of the use of the agricultural land. Assuming that the rational land use is possible only at a sufficient density of stable rural settlements, the zoning of districts (municipalities) was carried out according to the density of rural inhabitants and villages in the area of agricultural land. It was found that the most densely populated areas are near large cities and in the southern and southeastern regions of the country (Fig. 1).

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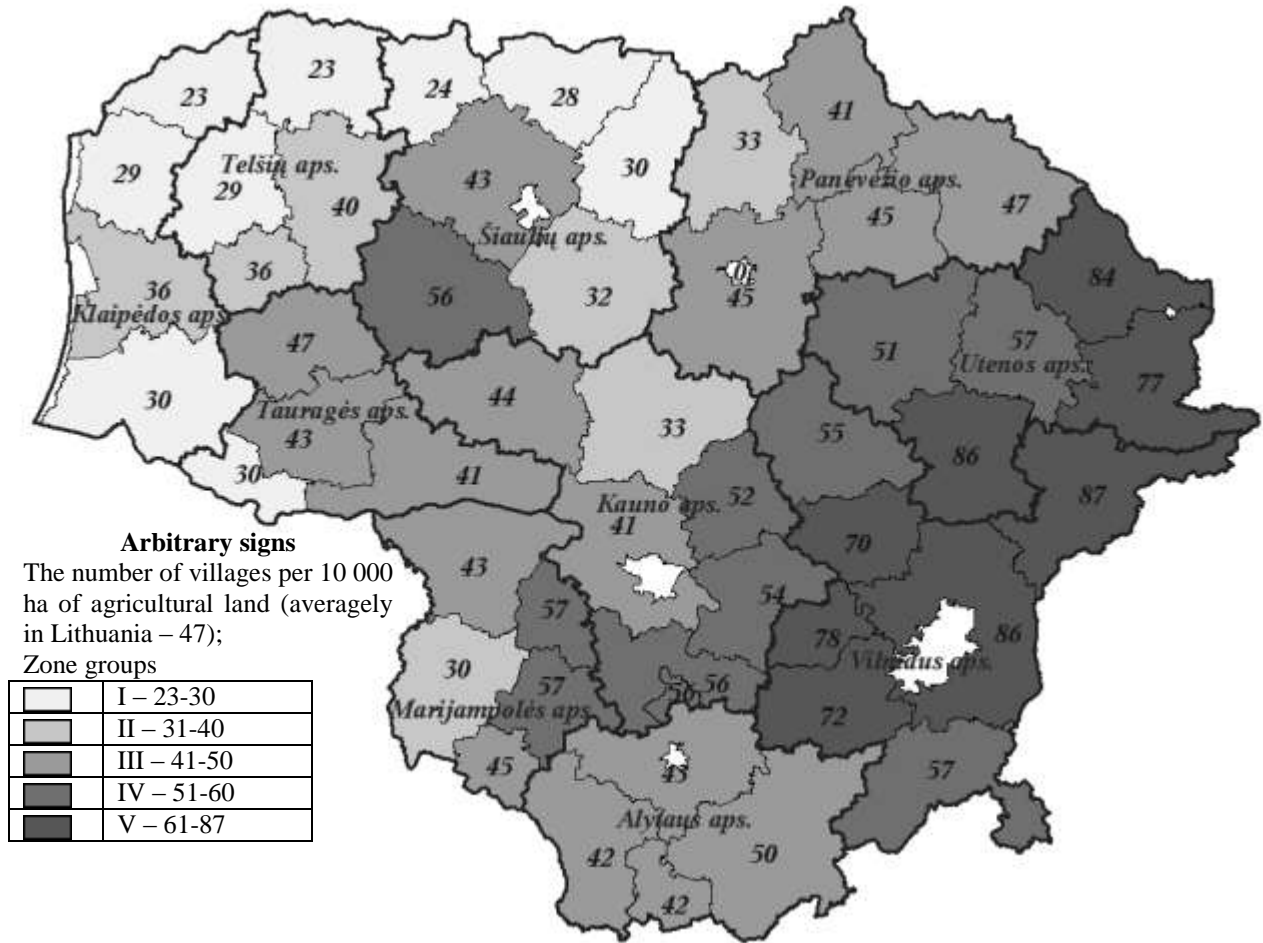
<sup>1</sup> P. Aleknavičius. Darbo išteklių teritorinio išsidėstymo reguliavimas kaime // Article in „Lietuvos kaimas 2000-aisiais metais“. Edited by A. Poviliūnas, J. Pilypas, D. Jokūbaitienė. – Vilnius, 1987, 224 p. P. 93–97.



**Fig. 1.** Number of inhabitants per 100 ha of agricultural land

According to the data of the population census, there were 18459 villages in Lithuania in 2001, in which lived 1 or more inhabitants. Having compared this data with the one carried out in 1989 it was defined that 1213 villages have disappeared during the period of 12 years. This decrease averagely makes up 6.2 percent of the former number of the villages and is the highest in Rokiškis, Anykščiai, Ukmergė, Švenčionys and Zarasai districts (10.0–11.8 percent). It depends not only upon the smallness of farms, but upon the common tendencies of the decrease of the inhabitants of villages in problematic regions as well.

Due to the historical and natural-geographical reasons, the average area of the land designated for agricultural purposes (falling on one village) is of different sizes: from 114–118 ha (Molėtai, Švenčionys, Vilnius, Zarasai districts) up to 416–431 ha (Akmenė, Mažeikiai, Skuodas districts). 5 zones are singled out in Lithuania according to the density of villages (Fig. 2). The most significant differences are between districts situated in western and northern territories of our country (23–30 villages fall on 10 km<sup>2</sup>) and districts situated in the eastern territory of our country (77–87 villages, correspondingly).



**Fig. 2.** The number of villages per 10 km<sup>2</sup> of the agricultural land (2001)

Evaluating the dislocation of large settlements, solutions of the general plans for the territories of the municipalities allowing to built farmsteads even in small villages and individual farms (if the conditions to serve inhabitants from towns, small towns or large villages are guaranteed) were used. It was assumed for the investigations, that the distance from these objects for the service of rural inhabitants (up to the most remote farmsteads) as well as for the organization of agricultural production (up to the fields used by the farmers living in settlements) should be not larger than 3 km. So, an optimal service zone of the large settlement could be calculated using the following formula:

$$P_{gyv} = \pi \cdot r^2 \cdot k_1 \cdot k_2, \quad (1)$$

here:

$P_{gyv}$  – the area of the land used for agricultural purposes, serviced from the settlement;

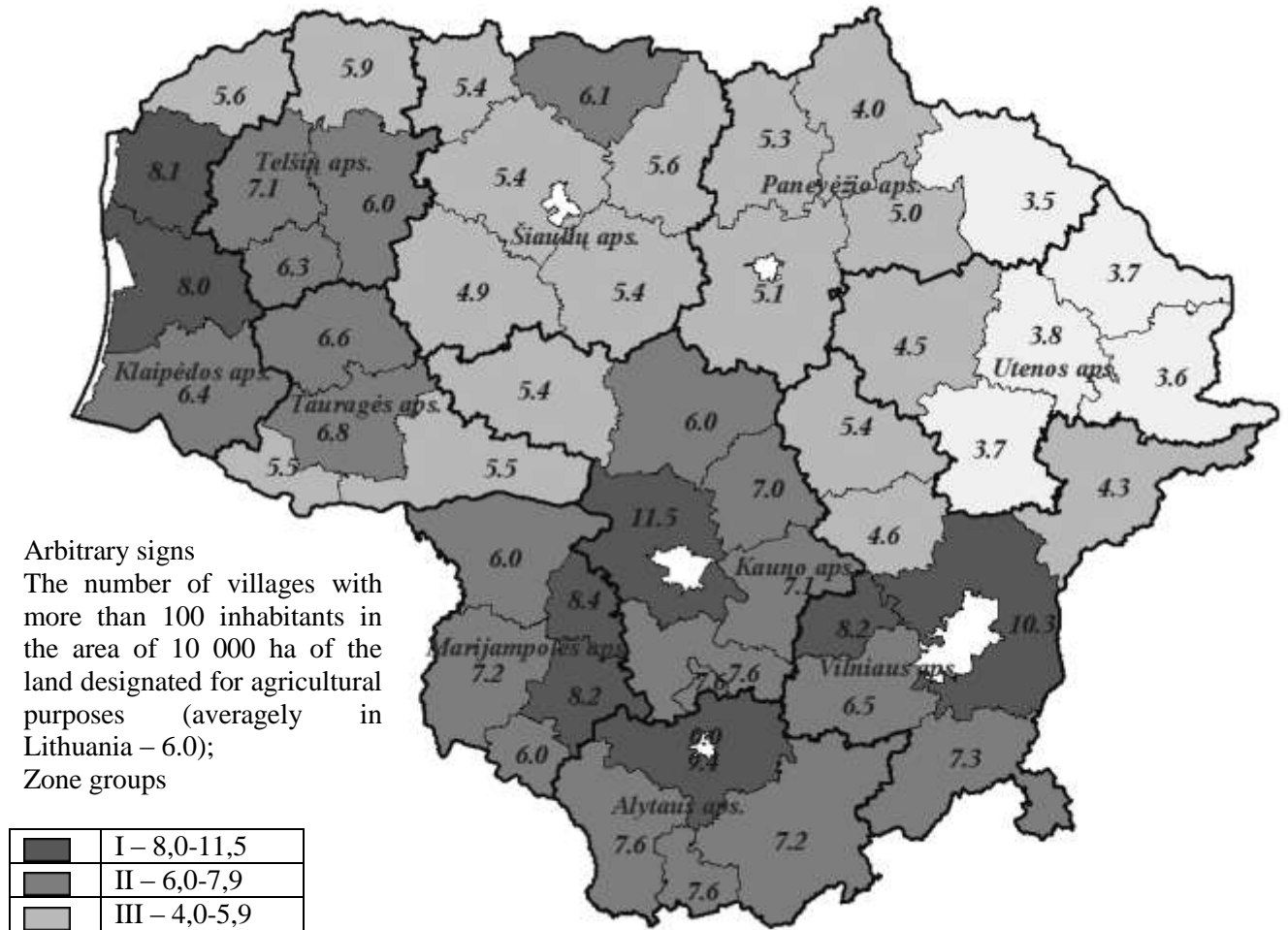
$r$  – the farthest calculated distance;

$k_1$  – coefficient of the road network complexity;

$k_2$  – coefficient of the land use structure.

Following the data of the analysis of the land management projects it was defined that the value  $k_1$  is 1.2–1.3 in regions of flatlands, in the regions of hilly and wavy relief – 1.4–1.5. Following the statistical land record data the values of the coefficient  $k_2$  were defined as follows: in the regions of flatlands – 0.85–0.9, in the regions of hilly and wavy relief – 0.7–0.8. Therefore, in the service zone of large settlements there should be not more than 3.3–3.4 thousand ha of the land designated for agricultural purposes both in the regions of hilly and wavy relief and in the regions of flatlands. Calculating the number of large settlements for the territory of 10 km<sup>2</sup>, it is admitted that 10–20 percent of these settlements are close to each other, i.e. their service zones intersect. Considering that there should be not less than 3.6–4.1 large rural settlements in the area of 10 km<sup>2</sup> of the land

designated for agricultural purposes. The data of the investigations show that in the majority of districts this index is being reached: on the average in Lithuania it is equal to 6.0. The most suitable dislocation of the settlements is near large towns. However, in separate districts only 3.5–3.7 large settlements fall on the area of 10 km<sup>2</sup> of the land designated for agricultural purposes (Fig. 3). Such situation should be improved by developing more large settlements (at present with less than 100 inhabitants in them) and by applying measures allowing avoiding the further decrease of the number of rural inhabitants.



**Fig. 3.** The number of villages with more than 100 inhabitants in the area of 10 km<sup>2</sup> of the land designated for agricultural purposes (2001)

During the analysis of large rural settlements they were classed according to their size, the tendencies of the change of the number of citizens as well as their dislocation. In 2001, the total number of the settlements with more than 100 inhabitants in them in the Lithuanian rural districts and municipalities was 2374. According to their size they distributed in the following way: settlements with more than 1000 inhabitants (category A) – 103, 751–1000 inhabitants (B) – 82, 501–750 inhabitants (C) – 199, 301–500 inhabitants (D) – 501, 101–300 inhabitants (E) – 1488. The tendencies of the change of the number of inhabitants show that 81.5 percent of larger settlements were relatively stable. In other words, the number of inhabitants has even increased during the period of 1989–2001 (Table 1).

According to their dislocation large settlements were distributed into the following groups:

I – suburban settlements. They include settlements situated up to 5 km from the limits of Vilnius, Kaunas, Klaipėda cities and 2–3 km from the centre of other towns-districts as well as within the limits of Palanga and Druskininkai towns;

II – settlements situated up to 1–2 km from other towns and large (>500 inhabitants) rural settlements;

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III – small towns;

IV – other settlements – central settlements of former collective (kolchozs) and state farms;

V – other settlements, central settlements of former agricultural enterprises (before the enlargement of farms) or centres of their territorial production subdivisions, former subsidiary and non-expanded settlements of some other character.

Table 1.

Distribution of large settlements according to their size and changes

No	County	The number of settlements according to their size			Of that number according to the changes during the period of 1989–2001					Growing and stable settlements	
		101–300 inh.	>300 inh.	total	>20 percent	11–20 percent	-10–+10 percent	-11–20 percent	<-20 percent	number	percent
1.	Alytus	137	52	189	16	14	116	30	13	146	77,2
2.	Kaunas	216	139	355	55	49	192	38	21	296	83,4
3.	Klaipėda	126	88	214	26	28	130	28	2	184	86,0
4.	Marijampolė	134	89	223	12	36	144	19	12	192	86,1
5.	Panevėžys	148	98	246	21	29	155	28	13	205	83,3
6.	Šiauliai	181	127	308	32	58	165	40	13	255	82,8
7.	Tauragė	111	60	171	17	34	97	17	6	148	86,5
8.	Telšiai	97	66	163	23	31	92	14	3	146	89,6
9.	Utena	122	52	174	8	20	85	40	21	113	64,9
10.	Vilnius	216	115	331	52	30	165	64	20	247	74,6
Total in Lithuania		1488	886	2374	262	329	1341	318	124	1932	81,4
Percentage		62,7	37,3	100	11,0	13,9	56,5	13,4	5,2	81,5	x

The carried out grouping of large settlements showed that averagely in Lithuania they distribute in the following way (in percent): I – 12,7, II – 12,2, III – 16,2, IV – 25,5, V – 33,5 (Table 2). It shows that the functioning of agricultural enterprises had large impact upon the formation of the system of rural settlements and strengthened stability of the whole system.

Table 2.

The structure of small towns and rural settlements (with more than 100 inhabitants in them) according to their dislocation

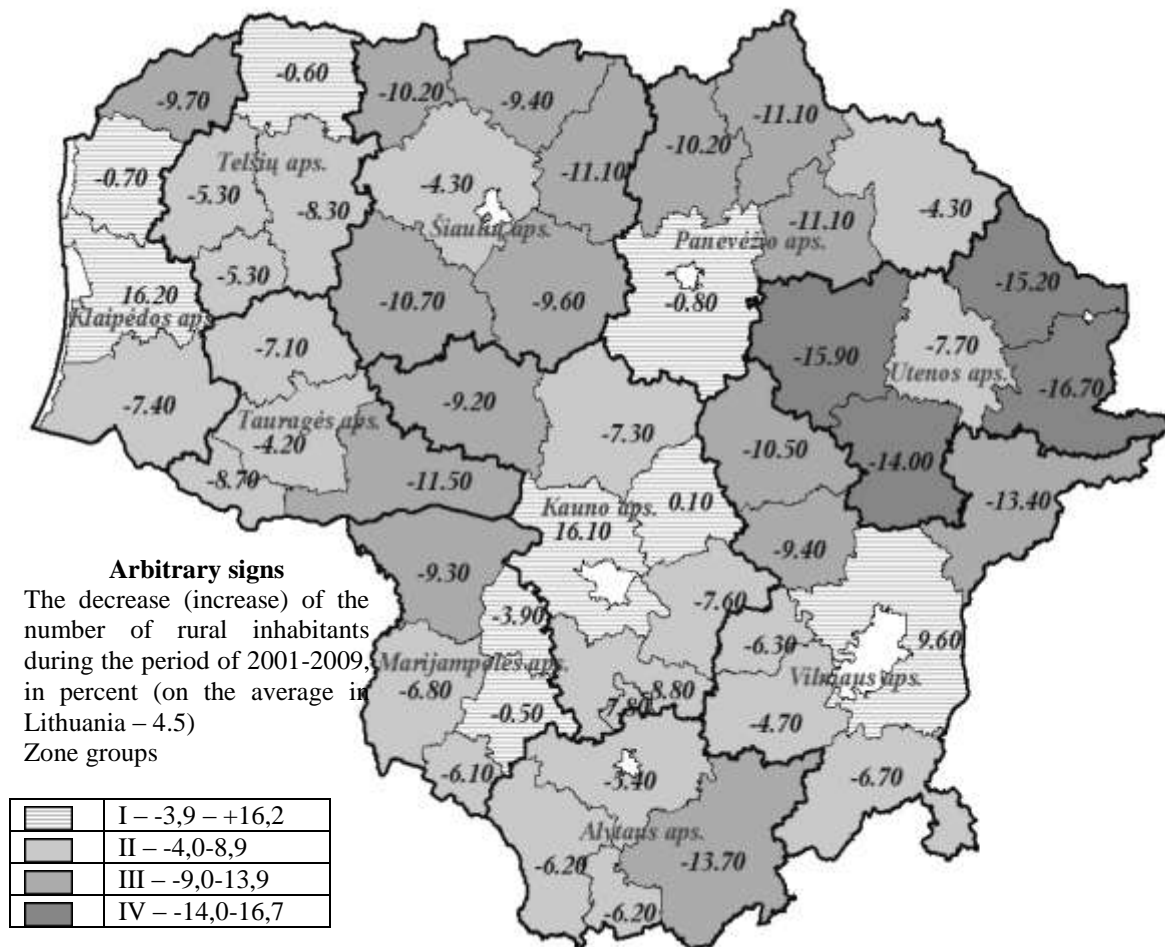
No	Indices	Number of inhabitants	Of these according to groups, in percent				
			I	II	III	IV	V
1.	Vilnius and Kaunas districts	218	28,4	11,0	15,1	8,3	37,2
2.	Remaining districts, situated:						
2.1	In northern Lithuania (3 counties)	548	10,8	14,0	18,6	19,7	36,9
2.2	In middle Lithuania (4 counties)	1036	10,7	11,0	16,5	29,1	32,7
2.3	In eastern Lithuania (3 counties)	572	11,9	13,1	13,8	30,9	30,3
3.	On the average	2156	11,0	12,4	16,3	27,2	33,1
4.	On the average in Lithuania	2374	12,6	12,2	16,2	25,5	33,5

The towns in Lithuania total 103, of which 51 are centres of rural municipalities. Nearby them there are situated 300 settlements with more than 100 inhabitants in them (Group I). The remaining smaller towns and small towns (Group III) remained the centres of attraction for inhabitants as well. The total number of those inhabited localities – 437 (52 + 385), and there are 290 large settlements more dislocated near them (Group II). The denser network of large settlements was caused by the establishment of the centres of agricultural enterprises; the number of these objects is 604 (Group IV). There are 795 large settlements attributed to Group V. They were established or developed from larger villages as the centres of former smaller farms or territorial subdivision centres of farms or those necessary for the service of production or other objects.

The main service centres for rural inhabitants – towns, small towns and central settlements of former collective and state farms (their total number – 1144) are dislocated in the entire territory of the country proportionally to the area of the land designated for agricultural purposes. About 1.9 thousand

urban centres (the service area of each is about 2 thousand ha in average), including settlements thickening the network of these settlements (with more than 100 inhabitants in them), service our country's rural inhabitants. The specialists of territorial planning recommend that new construction works should be developed only in already existing settlements (Bučas, 2010). The dislocation of these settlements should be as even as possible in the country and regions, and the settlements themselves should be provided with facilities and should be compactly urbanized, thus creating living conditions close to those in towns (Burinskiene, Lazauskaitė, 2010).

Despite the stable network of large settlements, the number of inhabitants in them can decrease as well due the attraction of cities, the shortage of suitable work and some other reasons. There are relatively more large settlements in Utena and Vilnius districts (where agricultural farming lands are of less economic value), where the number of inhabitants decreases. General tendencies of the decrease of rural population are presented in Fig. 4.



**Fig. 4.** The changes of the number of rural inhabitants in 2001–2009

In that case it is possible to predict that the further disappearance of rural settlements and the decrease of inhabitants (including and large settlements) will create unfavourable conditions for agricultural activity and will worsen service conditions for rural inhabitants in the eastern part of our country's territory, especially in Ignalina, Anykščiai, Zarasai, Molėtai and Švenčionys districts. Considering that, it is necessary to beneficially use the measures of the Lithuanian rural development program for 2007–2013 (Lietuvos...; Nacionalinė...), for the recreation of agriculture and to suitably prepare provisions of the Common Agricultural Policy after the year 2013 under Lithuanian conditions.

The number of inhabitants increases only in suburban districts, where the demand for their growth is connected with the urban sprawl into rural territories. After the more detailed analysis of the rural

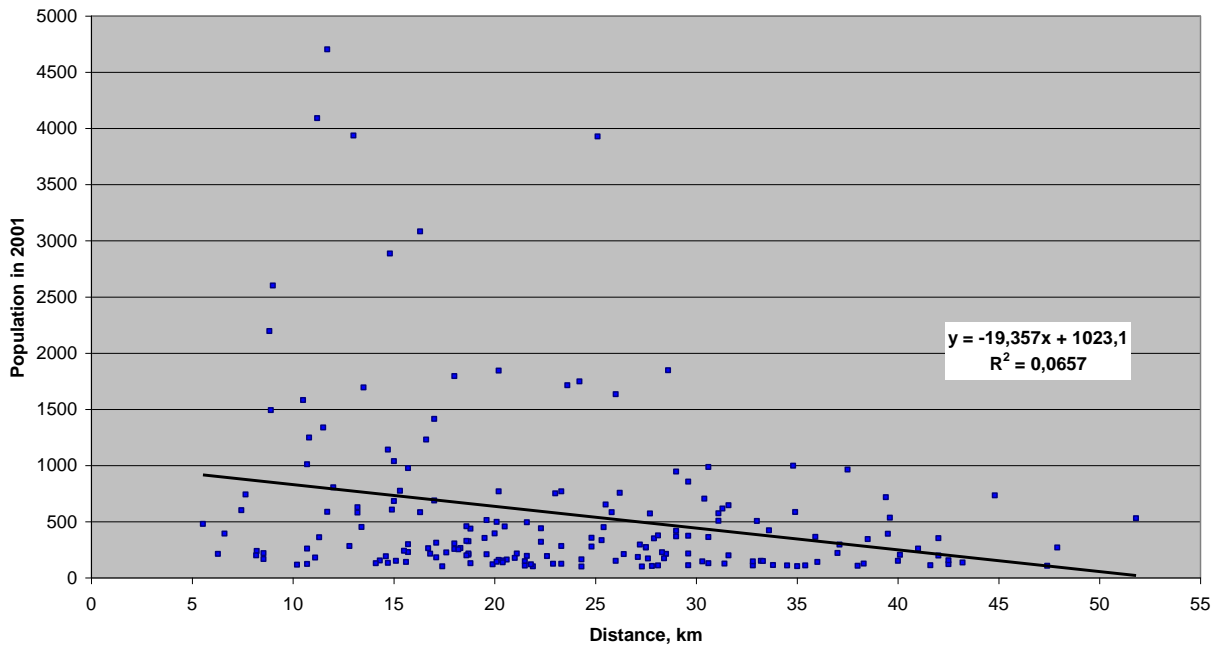
inhabited localities of Vilnius, Kaunas and Klaipėda districts one can see that the number of inhabitants in them increases at equal speeds, independently from the size of the settlement (Table 3).

Table 3.

The indices of the growth of large settlements in Vilnius, Kaunas and Klaipėda districts

No	Indices	The number of settlements in 1974	The average size of the settlement			Percentage of growth	
			In 1974	In 1989	In 2001	During 1974–1989	During 1974–2001
1.	Average-sized settlements (101–300 inhabitants lived in 1974)	104	181	280	317	155	175
2.	Large settlements (>300 inhabitants)	46	836	1262	1406	151	168
	Total:	150	382	581	651	152	170

The dislocation of large settlements situated in Vilnius, Kaunas and Klaipėda districts is showed in Figure 5.



**Fig. 5.** Dependence of the size of rural settlements situated in Vilnius, Kaunas and Klaipėda districts upon the distance to those cities

Having carried out the investigations, it was determined that near the cities large settlements developed in the entire territory of the district. The correlation between the size of the settlement and the distance from the town is weak ( $r = 0.256$ ,  $R^2 = 0.066$ ,  $t = -3.589$ ). The development of construction works in rural settlements of these districts was defined not by the distance to the town, but by the dislocation of the settlements near the roads of local and state significance and by the possibility to use nearby facilities as well as by the market value of land and interests of land owners to receive as much incomes from the use of the territory for non-agricultural purpose as possible. In works carried out by other authors it is stated that the redistribution of population goes on from cities into suburban territories where land prices are lower, but territorial planning is not coordinated and the dislocation of construction works is chaotic (Bardauskienė, Pakalnis, 2010). When implementing territorial master plans of the municipalities of districts, it is tried to regulate the growth of settlements by preparing special territorial planning documents.



**Conclusions**

1. The indices of system of rural inhabited localities are not equal in the whole territory of Lithuania. The density of villages in different municipalities differs up to 3.8 times; the number of rural inhabitants differs up to 5.7 times (calculating for the area of the land designated for agricultural purposes).

2. Large settlements ensure stability of rural inhabited localities. The majority of those settlements have formed in the period when the works on moving of individual farms as well as the building works of the settlements necessary for the activity of agricultural enterprises took place. The number of settlements (with more than 100 inhabitants in them) is sufficient for the ensuring services for rural inhabitants, and the difference between the densities of these settlements (comparing with the average of our country) in different municipalities is not larger than 1.7–1.9 times.

3. During the period of 2001–2009, the number of rural inhabitants in Lithuania has decreased by 4.5 percent, however, this percentage makes up 10.1–16.7 in 13 districts, and in 9 municipalities situated within the influence zones of the cities the number of inhabitants has increased or remains relatively stable.

4. The further disappearance of villages and the decrease of inhabitants in rural areas can have significant negative consequences upon agricultural activity and rural development in 8 problematic districts, where the network of large settlements is thin (4.5 settlements or less calculating for the area of 10 km<sup>2</sup> of the land designated for agricultural purposes). Additional organizational and state economical support measures are necessary in these districts that would ensure better working conditions and life quality, stabilize or even increase the number of inhabitants in large rural settlements.

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**Резюме**

**ПРАНАС АЛЕКНАВИЧЮС, ЙОЛАНТА ВАЛЬЧЮКЕНЕ, МАРИОС АЛЕКНАВИЧЮС, ИССЛЕДОВАНИЕ СТРУКТУРЫ СЕЛЬСКИХ НАСЕЛЁННЫХ МЕСТ**

В статье приведён анализ размещения и развития сельских населённых пунктов в административных единицах Литвы. К сельским населённым пунктам отнесены 247 городки и около 18 тыс. деревней. В период социалистического строя наиболее интенсивно росли центральные посёлки хозяйств, в которых переселялись семьи из ликвидируемых хуторов. Крупные сельские населённые пункты являются гарантом стабильности системы расселения, оно обслуживают и другие, проживающие в мелких деревнях семьи. Всего в 2001 г. в Литве насчитывалось 2374 населённые пункты с населением более 100 человек. Однако сельские жители

размещены в административных территориях неравномерно: наибольшая плотность в пригородных районах и в южной и юго-западной части Литвы, наиболее низкая плотность – в северных и северо-восточных районах. Соответственно неравномерно размещены и крупные посёлки, в расчёте на единицу площади земли сельскохозяйственного назначения. Определены проблемные ареалы, где необходимы экономические и организационные мероприятия, способствующие регулированию сельского населения, улучшению условий труда и жизненного уровня. При отсутствии государственной поддержки дальнейшие негативные процессы – исчезновение деревней и сокращение сельского населения – будут иметь значительные последствия для землепользования, сельскохозяйственное производство и развитию села в 8 районах Литвы.

*Ключевые слова: сельский населённый пункт, земля сельскохозяйственного назначения, землепользование, население.*