Demographic disproportions of the new administrative-territorial system of the Lviv Oblast

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Abstract. The concept of «demographic disproportions of the administrative-territorial system» is defined as the differences between territorial communities in terms of population, population distribution in central and other settlements, population density, and density of the settlement network, which is the result of diversity of natural and geographical conditions, population-recovery and migration processes. The new administrative-territorial division of Lviv Oblast consists of 73 communities in seven districts. They are characterized by sufficiently contrasting demographic parameters: number and density of population, natural population growth, relative migration balance, level of urbanization, and density of settlement network. The article proposes a method of assessing demographic disproportions between territorial communities using coefficients of deviation from mean statistical values, as well as the standard deviation. For Lviv Oblast, it revealed large disproportions in the number of the population, population density, and population of the center of territorial community; average disproportions by area, number of settlements, and density of the settlement network; and small according to population of territorial communities and population of their centers, without considering Lviv, as well as population density, not taking into account the Lviv community. According to the types of territorial communities, the greatest demographic disproportions were found between urban communities and the lowest between village and urban-type settlement communities. The hierarchical-clustering method was used to group the territorial communities according to fourteen relative values and deviations from the statistical average. Eight clusters were identified, which were united into three groups. The Lviv community with the population of 790,500 people, which should become the basis of the future Lviv agglomeration, was designated separately. According to the spatial patterns, the Lviv agglomeration could include the Zymna Voda village community, which is functionally connected with Lviv and is in sharp contrast to the other village communities. Demographic disproportions between the territorial communities must be accounted for when charting out a regional development strategy of Lviv Oblast, with a differentiation by types of territories. Also, the results of our research may be used in designing special approaches to assessing the financial capacity of similar communities and planning their spatial development. In particular, this is relevant for the optimization of educational and healthcare institutions, centers of administrative services in communities, work of public transport, and the organization of municipal services.

Keywords: demographic disproportions, population, territorial community, administrative-territorial division, region, Lviv Oblast

Демографічні диспропорції нового адміністративно-територіального устрою Львівської області

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Анотація. Сутність поняття «демографічні диспропорції адміністративно-територіального устрою» визначаємо як відмінність між територіальними громадами за показниками кількості населення, розподілом населення між центральними та іншими поселеннями, щільністю населення і густотою поселенської мережі, що є результатом неоднорідності природно-географічних умов, демовідтворювальних і міграційних процесів. Новий адміністративно-територіальний устрій Львівської області сформований 73 громадами у складі семи районів. Вони характеризуються достатньо контрастними демографічними параметрами: кількістю та щільністю населення, природним відтворенням, відносним міграційним сальдо, рівнем урбанізації та густотою поселенської мережі. Розроблені методика оцінки демографічних диспропорцій між територіальними громадами за допомогою коштовних відхилення від середньостатистичних значень, а також стандартизованого відхилення. Визначено, що у Львівській області існують значні диспропорції за кількістю населення, щільністю населення і людністю центру територіальної громади; середні диспропорції – за площею, кількістю поселень та густотою поселенської мережі; малі – за

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Introduction

The reformation of local self-governance and territorial organization of power in Ukraine (the Decentralization Reform), which has been actively implemented since 2014, is considered the most successful of the key reforms aimed at adapting the country’s institutionalized environment to the best global (European) governing practices. At the national level, an important step had been taken towards introduction of the European standards of regionalization of the country – designating regions with demographic scales according to NUTS-2 parameters, which are basic for conducting regional policy. At the level of oblast administrations, the boundaries remained almost unchanged, whereas the district level underwent significant transformations – the number of districts decreased from 490 to 140. The number of basic administrative-territorial formations has also decreased notably.

Unfortunately, the declared reforms had failed to overcome the large spatial and demographic disproportions between the administrative-territorial units. Such differences in many regions also remained at the level of districts, as well as at the level of territorial communities. This was evidenced by the results of studies conducted by Ukrainian researchers at the national (Skliarska, 2021) and regional levels (Baranovskyi, 2016; Shevchuk, 2020). Especially notable disproportions were seen in populations of districts in oblasts with large regional capitals, such as Kharkiv, Odesa, Lviv, and also in mountain (Ivano-Frankivsk) and poorly populated (Chernihiv) oblasts (Skliarska, 2021).

At the beginning of the reform, Lviv Oblast had 44 city councils, 34 urban-type settlement councils, and 632 village councils. As a result of enlargement, the new arrangement is comprised of 73 territorial communities in seven districts. The territorial communities of Lviv Oblast formed in 2020 are characterized by quite contrast parameters of area and population.
Obviously, implications of powerful internal and outbound migrations can soon be assessed, once Ukraine is liberated from the occupiers. However, further research in Lviv Oblast should be based on the foundation of demographic parameters and demographic disproportions at the lowest level of administrative division as of 2021. This was the main objective of the conducted study, carried out within the framework of a scientific-research topic «Socio-Geographic Problems of Development of Western Region of Ukraine in Post-War Period» of the Department of Economic and Social Geography of the Ivan Franko Lviv National University.

Practical significance of the results is that they can be used to chart out strategies of development of the territorial communities and a locational differentiation strategy for regional development, which should account for demographic parameters of administrative units at the basic level, in particular number of population, which is one of the criteria of the level of financial capacity of a territorial community. Post-war reconstruction of Ukraine should be based on objective data of demographic potential of territories at the local level, which would determine, among other things, their investment attractiveness and ability to gradually develop, because it is fairly obvious that a resource potential of a community cannot be realized in absence of a required human potential.

Analysis of publications focusing on the topic

Social-geographic preconditions of reforming the administrative-territorial division were an object of many studies. Therefore, at the first stage of the decentralization reform, in early 2017, on the example of 26 united territorial communities of Lviv Oblast, O. Skliarska demonstrated significant territorial and demographic disproportions that directly determined infrastructural and financial capacities of the territories (Skliarska, 2016). Study of financial capacities of the formed administrative districts of Lviv Oblast according to the 2020 data revealed their significant differentiation (Vlakh et al., 2023). The authors indicated that various starting conditions for functioning are associated with area, population, population density, and urbanization level.

Differences between newly-formed districts by area and number of population were also found at the national level (Skliarska, 2021). Having assessed the specifics of functioning of financially capable territorial communities in Ukraine, where one of the financial criteria is number of resident population, the research concluded that «obviously it is impossible to avoid another stage of enlargement, first of all in order to provide an actual financial capacity to territorial communities in districts with deep demographic crisis» (Skliarska, 2022).

Similar studies were conducted at the national level, and also for other regions of Ukraine. Y. Oliinyk and V.Ostapenko proposed a criterion that should be utilized to identify the financial capacity of territorial communities (Oliinyk, Ostapenko, 2016). M.Baranovskyi, on the example of the Ukrainian Polissia, studied the influences of the main factors on the financial capacity of territorial communities, including demographic potential (Baranovskyi, 2016). S. Shevchuk put forward a scheme for the new administrative-territorial division of Poltava Oblast that differed from the Promising Plan. This scheme was developed based on analysis of the system of population dispersion, existing and potential population-growth areas (Shevchuk, 2020). A complex evaluation of how the decentralization reform has been implemented was carried out by A. Melnychuk. He states that most existing territorial communities need measures to increase their financial capacities, which should be identified not only using the statistical-schematic approach, which includes resource, demographic, and financial capacities, but also by employing a much larger list of criteria of the abilities to effectively manage, plan strategies, and prosper (Melnychuk, 2020).

Materials and methods

The conducted study dealt with the smallest unit of the administrative-territorial division of Lviv Oblast – territorial community, and was mostly based on quantitative methods. To analyze the demographic parameters and chart schematic maps, there were used official data of the Portal of Financial Capacities of Territorial Communities of the Ministry of Development of Communities and Territories of Ukraine (Portal spromozhnosti hromad, 2022) and the website of the State Service of Statistics of Ukraine (Population of Ukraine, 2023; Population and migration, 2023): parameters of area, number of settlements, overall number of population, and population of the centers of territorial communities in 2001-2021. Cartographic source for the study was the Atlas of Administrative-Territorial Division of Ukraine (Ostapenko et al., 2020).

The first stage was assessment of specific shares of the centers of communities in the general number of population, density of population, and density of settlement network at the level of territorial communities and districts, mean statistical value in the
oblast, including and not including the oblast capital, Lviv, the population of which is 724.3 thou people, accounting for 29% of population of the oblast. Those mean values became the basis to determine disproportions at the local level.

The second stage was estimation and analysis of demographic and spatial-pattern disproportions using the two coefficients. The first is coefficient of deviation from the mean statistical value for all the territorial communities, which indicates percentage of how the actual parameters of all territorial communities differ from the mean statistical (1). Positive or negative value of the coefficient reflects the deviation pattern, and its value – deviation value from the conventional zero level.

\[ \frac{x-\bar{x}}{\bar{x}} \times 100 \]  

(1)

For all territorial communities, there were estimated the following coefficients: deviation from mean number of population, deviation from mean population, not considering Lviv, deviation from mean area of a community, deviation from mean density of the population, deviation from mean density of population, not considering Lviv community, deviation from mean population of the center of community, not considering Lviv, deviation from mean number of settlements in a community, and deviation from mean density of settlement network.

The second coefficient was standard deviation ST.DEVS (2), estimated using add-on XLSTAT functions of the Excel software. It mathematically demonstrates how far apart the data points are located in relation to their mean value. According to each demographic and spatial-pattern parameter, there was found standard deviation for all 73 territorial communities. To interpret the results, it is important that the standard deviation is of the same size as the basic value.

\[ \sqrt{\frac{\sum(x-x)^2}{n-1}} \]  

(2)

At the third stage, to detect demographic and spatial-pattern characteristics of administrative-territorial units at the basic level, and also disproportions between them, using the method of hierarchical clustering, 72 territorial communities of Lviv Oblast were grouped according to fourteen relative values and parameters of deviation from mean statistical value (when omitting the Lviv community). The territorial communities were grouped into clusters in the dendrogram using the shortest Euclidean distance.

Statistical method gave the opportunity to chart schematic maps reflecting demographic and spatial-pattern disproportions of territorial communities, and to perform a spatial analysis.

Results and analysis

Since the mid 20th century, the administrative-territorial division of Lviv Oblast underwent notable changes ten times. The longest existing boundaries between twenty districts existed from 1965 and 2020. However, at the lowest level, changes were not permanent. Especially active formation was observed for village councils right after 1991, which had certain demographic preconditions, because since the early 1990s, there was recorded the highest population of the Oblast in its history.

Reforming the administrative-territorial division in 2020 accounted for the existing boundaries; number of population; specifics of local systems of population dispersion, formed based on daily migrations of population and social and economic relations between settlements; configuration of transport network; and presence of geographic barriers.

In Lviv Oblast, seven districts were formed, and the new territorial division at the basic level is comprised of 73 communities, including 39 urban, 16 urban-type settlement, and 18 village communities (Table 1). The largest number of communities is in Lviv District – 23; and Drohobych District has only 5. Two districts, Drohobych and Chervonohrad, the capitals of which are the largest cities of the oblast, include no village communities.

As of January 1 2022, the population of Lviv Oblast was 2,478 thou people (Population and migration, 2023). Depopulation processes have begun in 1994, primarily due to long migration outflow in previous periods, particularly from mountainous and bordering areas. Only starting from 2014, migration balance became positive and has been remaining such since. Significant migration inflow of the population was caused by the beginning of the full-scale Russian invasion of Ukraine. As of late 2022, in Lviv Oblast, 251 thou internally displaced people were recorded, including 150 thou in Lviv, but according to estimates of representatives of the regional authorities, their overall number approached 500 thou people (Kozytskyi, 2022).

Natural decline of the population of Lviv Oblast was for the first time recorded in 1995. However, the rates of depopulation remained lower than in general for Ukraine. During 2001-2021, the population of the oblast decreased by 5.7%, whereas in Ukraine it decreased by 15.4% (Population of Ukraine, 2023). At the national level, Lviv Oblast is characterized by higher parameters of population density, settlement-network density, including 44 cities and 34 urban-type settlements, and a large regional capital –
Lviv. Diversity of the natural-geographic conditions – plains with some elevated regions (Roztocze, Opillia, Holohory) and southern mountain belt of the Carpathians – resulted in notable differences in the spatial demographic pattern of rural population. All of this directly affects the territorial-administrative division and the main demographic and spatial-pattern parameters of the lowest-level administrative formations.

Administrative districts of Lviv Oblast vary broadly by the main morphological parameters. The largest, Lviv District, is 4.3 times bigger than the smallest, Drohobych. There are also disproportions by the main demographic parameters within the district population-dispersion patterns. However, it has to be noted that the expanded administrative districts had seen a noticeable reduction in their managerial functions, which are now limited solely to the executive power that regulates the state bodies such as prosecutor’s office, courts, police, pension fund, social protection, and tax agency.

Population of Lviv District is over 7 times such of the smallest Zolochiv District. Such differences in general are characteristic for other regions where the largest state agglomerations became the district centers. In 2021, the natural decline occurred in all the districts (Table 2), being the lowest in Yavoriv and Lviv Districts, in particular the city of Lviv, because of more favorable age structure (Hudzelyak, 2016; Hudzelyak, Vanda, 2017). Significant natural decline was observed in peripheral districts – Chervonohrad and Zolochiv, the demographic potential of which has been exhausted and the age structure has aged as a result of long migration outflow of young people. Positive migration balance in Lviv Oblast has formed primarily thanks to the high attractiveness of the Lviv agglomeration.
One of the criteria of the oblast’s division is balance between the area and population of the local administrative units for effective self-governing, formation of territorial communities with proportionate parameters to optimize the social services and making them more accessible to the population.

Demographic disproportions of administrative-territorial division of the region are the differences between the territorial communities according to the parameters of number of population, population dispersion across central and other settlements, population density, and density of settlement network. Those disproportions stem from the diversity of natural-geographic conditions, population-recovery, and migration processes.

The geospatial organization of population of Lviv Oblast indicates disproportions at the level of newly formed territorial communities (Fig. 1). High population density near the oblast capital within the Drohobych polycentric agglomeration, in the zone of influence of cities Stryi, Sambir, and Chervonohrad, and also along the Lviv-Stryi axis, where industrial centers Mykolaiv and Novyi Rozdil gravitate towards the Kyiv-Chop highway. In the oblast’s east and northeast mountain communities the density is low.

**Fig. 1.** Population of territorial communities of Lviv Oblast
During 2001-2021, the territorial communities of Lviv Oblast mostly have been undergoing depopulation processes, especially the southwest pre-mountain and southeast Opillia territories, and some bordering and remote parts of the region. Population has increased only in the suburban area of Lviv, and the exception was the northern outskirts, where the ecological situation is complicated due to presence of a municipal-waste landfill. In the oblast capital proper, the number of population for this period declined.

An average territorial community of Lviv Oblast contains 26.4 settlements (Table 3), while such parameter for Ukraine in general is 20.2. In the central settlements of territorial communities, there live 43% of the population (not accounting for the population of the city of Lviv), and 59% together with the oblast capital. Average population of the center of a community (not considering Lviv) accounted for 10.5 thou people. The central settlements of territorial communities generally demonstrated a better demographic dynamics and are characterized by relatively more favorable demographic situation compared with peripheral settlements. Especially sharp contrasts were seen in the communities with insufficient development of a transport network.

Analysis of the mean-statistic values revealed demographic and population-dispersion disproportions, presented in Table 4. Based on the STDEV.S standard deviation, there were determined large disproportions by population number, population density, and population of the center of territorial community; mean disproportions by area, number of settlements in the territorial communities, and density of settlement network; and small disproportions by number of population of the territorial communities and population of their centers, not considering Lviv, and population density, not considering the Lviv community.

According to population of territorial communities, standard STDEV.S deviation was 92 thou people, while not accounting for the population of the city of Lviv, it was 20.8 thou people, which in general can be interpreted as a high deviation, because the mean population of a territorial community, not considering Lviv, accounted for 24.3 thou people. Parameters that are close to the mean statistical model were seen for the Peremyshliany urban, Boryn urban-type settlement, and Davydov village communities. The analysis revealed large disproportions according to population of the center of territorial community – standard deviation of 14.4 thou people, against the background of mean-statistic value of 10.5 thou people, if not accounting for Lviv. Such centers that have the minimum deviation from the mean statistical value are

<table>
<thead>
<tr>
<th>Table 3. Mean-statistic parameters of territorial communities of Lviv Oblast, 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean population of territorial community, people</td>
</tr>
<tr>
<td>Mean population of territorial community, not taking into account Lviv, people</td>
</tr>
<tr>
<td>Mean population of urban community, people</td>
</tr>
<tr>
<td>Mean population of urban community, not considering Lviv</td>
</tr>
<tr>
<td>Mean population of urban-type settlement community, people</td>
</tr>
<tr>
<td>Mean population of village community, people</td>
</tr>
<tr>
<td>Mean population of center of territorial community, not considering Lviv, people</td>
</tr>
<tr>
<td>Mean population of center of territorial community, not considering Lviv</td>
</tr>
<tr>
<td>Mean area of territorial community, km²</td>
</tr>
<tr>
<td>Mean density of population in territorial community, people/km²</td>
</tr>
<tr>
<td>Mean number of settlements in territorial community</td>
</tr>
<tr>
<td>Mean density of settlement network in territorial community, number/1,000 km²</td>
</tr>
</tbody>
</table>

Estimated by the author according to the data (Portal spro-mozhnosti hromad, 2022).

Kamiana-Buzka, Krasne, and Zymna Voda. Large disproportion in population density is the result of very high population density (2,527 people/km²) in the Lviv urban community. Without it, the standard deviation for the rest local administrative units was 29.5 people/km². Against the background of the mean statistical of 129.2 people/km², it is not a significant disproportion.

The mean disproportion – according to the territory size: standard deviation equaled 181.1 km² against the average area of 298 km². Approximately the same were the scales of disproportions by number of settlements in a community. Slightly lower differences between the communities were seen according to density of settlement network, except southern mountainous part of Lviv Oblast. Mountain communities – Skole and Slavske – have the most negative deviations from the mean density of settlement network, and the closest communities to the mean population-dispersion parameters were the Staryi Sambir, Novyi Kalyniv, Zhuravno, Trostianets.

Analysis of disproportions according to types of communities demonstrated the largest disproportions among the urban communities, first of all because of Lviv, where 790.5 thou people reside, or 31.6% of the oblast’s population, and the Drohobych community, the center of which is the second populated city of the oblast. In the Drohobych community, population
of the center is 618% higher than the mean value for the oblast. Asymmetric parameters were noted for the Yavoriv community, area of which is 182% larger than the average in the oblast, and the number of settlements is 211% higher.

The lowest disproportions were between the urban-type settlement and village communities. Minimum deviations from the mean parameters were identified for the communities of Medenychi by area, Zhuravno by number of settlements and density of settlement network, Borynia by population, Zymna Voda by population of the center, not accounting for Lviv. At the same time, the population density in the Zymna Voda village community, which borders with Lviv, is 306% higher than the oblast’s average. The highest deviations according to population indicate insignificant demographic potential of Hnizdychiv urban-type settlement and Zabolotsi village communities, and also minimum share of population in the central settlements of the Pomoriany village and Trosianets village communities.

The centers of territorial communities perform the system-forming role, and the attraction force of other settlements is directly proportionate to the value of human potential of the core of the system of population dispersion and inversely proportionate to the distance between the center and the settlements that are in its influence range. Therefore, dysbalance in demographic potential of settlements of a territorial community can be leveled out by presence of well-formed transport network, which connects settlements with the community center. However, identifying local spatial connections and understanding challenges of a poor connection between community settlements require additional research.

The method of «tree of connections» was employed to perform taxonomy of 72 territorial communities according to the demographic parameters and parameters of deviation from the mean values of the population number and indicators of settlement network (Fig. 2).

Eight taxa were distinguishable into three groups: the first group of clusters (C1, C3, C6), the second (C2, C5), and the third group (C4, C7, C8) (Fig. 3). The Lviv community was designated separately. It is the territory that in the future can be the core of the Lviv agglomeration. In Lviv, 724 thou people reside, or 92% of the community population. It is one of the largest cities of Ukraine and the regional center of West Ukraine.

The first group of clusters is formed by the urban communities, and also the Zymna Voda village community, located in the suburban zone of Lviv.

### Table 4. Demographic disproportions of territorial communities of Lviv Oblast, 2021

<table>
<thead>
<tr>
<th>Indicators</th>
<th>STDEV.S Standard deviation</th>
<th>Coefficient of deviation from the mean-statistic value according to types of territorial communities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population of territorial community, thou people</td>
<td>92.0</td>
<td>Deviation urban % Urban-type settlement % village %</td>
</tr>
<tr>
<td>max Lviv</td>
<td>+2210 Hnizdychiv -79 Zabolotsi -82</td>
<td></td>
</tr>
<tr>
<td>min Zhovkiv</td>
<td>+2 Borynia -31 Davydiv -40</td>
<td></td>
</tr>
<tr>
<td>Population of territorial community, not considering Lviv, thou people</td>
<td>20.8</td>
<td>max Drohobych +408 Hnizdychiv -70 Zabolotsi -74</td>
</tr>
<tr>
<td>min Peremyshliany</td>
<td>-1 Borynia -3 Davydiv -15</td>
<td></td>
</tr>
<tr>
<td>Population of center of territorial community, not considering Lviv, thou people</td>
<td>14.4</td>
<td>max Drohobych +618 Pomoriansy -88 Trosianets -95</td>
</tr>
<tr>
<td>min Kamianka-Buzka</td>
<td>+1 Krasne -39 Zymna Voda +4</td>
<td></td>
</tr>
<tr>
<td>Area of territorial community, km²</td>
<td>181.1</td>
<td>max Yavoriv +182 Borynia +119 Zymna Voda -89</td>
</tr>
<tr>
<td>min Dobromyl</td>
<td>-1 Medenychi -2 Strilky +9</td>
<td></td>
</tr>
<tr>
<td>Density of population in territorial community, people/km²</td>
<td>310.6</td>
<td>max Lviv +1666 Lopatyn -80 Zymna Voda +306</td>
</tr>
<tr>
<td>min Pustomyty</td>
<td>+10 Kulykiv -28 Obroshyne +21</td>
<td></td>
</tr>
<tr>
<td>Density of population in territorial community, not considering the Lviv community, people/km²</td>
<td>29.5</td>
<td>max Sambir +560 Lopatyn -74 Zymna Voda +349</td>
</tr>
<tr>
<td>min Morshyn</td>
<td>-9 Kulykiv -19 Rozvadiv -13</td>
<td></td>
</tr>
<tr>
<td>Number of settlements in territorial community</td>
<td>16.6</td>
<td>max Yavoriv +211 Hnizdychiv -51 Sokilnyky -89</td>
</tr>
<tr>
<td>min Staryi Sambir</td>
<td>-2 Zhuravno +2 Koziova -9</td>
<td></td>
</tr>
<tr>
<td>Density of settlement network, number/1,000 km²</td>
<td>29.5</td>
<td>max Skole -68 Slavsko -61 Dobrosyn-Ma-heriv +61</td>
</tr>
<tr>
<td>min Novyi Kalyniv</td>
<td>+3 Zhuravno +3 Trosianets -4</td>
<td></td>
</tr>
</tbody>
</table>

The demographic disproportions of territorial communities of Lviv Oblast, 2021
Cluster C1 includes Boryslav, Truskavets, Novyi Rozdil, and Novoiayorivsk urban communities. Their centers are cities with 28 to 33 thou people population. The population density is one of the highest in the oblast, and at the same time the number of settlements within the territorial communities is almost twice lower than the mean level. Those are small communities with high concentration of demographic potential in the centers: Boryslav is home to 84% of the community’s population and 60% to 76% live in the centers of three other communities. Urban cores of those communities, except resort city Truskavets, have good infrastructure for industrial development. This can be considered a favorable factor for future re-industrialization based on the current technical resources.
Cluster C3 includes Drohobych, Stryi, and Chervonohrad urban communities. Those are the largest communities by population, which occupy large areas and have very high population density. Their centers are the largest cities of the oblast after Lviv. The city of Drohobych is the core of polycentral agglomeration in the southern pre-mountain part of the oblast. For some time, the city served as the capital of the former Drohobych Oblast, and therefore has a significant cultural and industrial potential for further development. Another population-increase area in the south of the region is the city of Stryi, which is distinct among other communities by a high financial capacity and significant geopositional advantages. The city of Chervonohrad is a conjunction in the northern industrial district, which has formed on the foundation of coal-extracting sphere. Despite significant ecological threats, low engagement of the public organizations and local elites, the territorial community has perspectives of economic growth because of its bordering location and the heightened transit functions, and also emergence of new types of economic activities. The centers of the cluster’s territorial communities concentrate 60-73% of the population, against the background of the average of 44.5% living in oblast’s urban communities of central cities.

Cluster C6 contains the smallest territorial communities: Zymna Voda and Sambir. Those are communities with highest population density – 580 and 852 people/km², respectively, with the mean oblast level of 115 people/km². The administrative center of Zymna Voda community concentrates 55% of the population, being the third most populated village in Ukraine (almost 11 thou people). The city of Sambir concentrates 93% of the community’s population, which is even higher than in the Lviv community.

The second group is represented by two taxa – C5, C2. Cluster C5 unites urban communities of the plain part of the oblast, which have formed around the largest district centers in the west, north, and east: Zolochiv, Brody, Busk, Horodok, Zhovkiv, Peremyshliany, Sokal, and Yavoriv. They are characterized by low – sometimes even twice lower than the average – population density, high number of villages, and insignificant percentage of the entire population in the centers – 25% in the Yavoriv to 59% in the Brody communities.

Cluster C2 contains territorial communities located in different natural-geographic conditions: Medenychi, Shidnysia, Kamianka-Buzka, Strilky, Staryi Sambir, Turka, Borodynia, Mykolaiv, Slavske, Koziova, Skole, Velykyi Mosty, Lopatyn, Belz, Radehiv, and Ivano-Frankivsk. They are characterized by large area, low population density, except the Mykolaiv community. Those are mostly urban-type settlement and urban communities, centers of which are small cities that need activation of economic and social functions. Share of population of the mountain communities that lives in the centers ranges 6% in Borynia to 31% in the Turka and Staryi Sambir communities. In the rest territorial communities of the plain part of the oblast, where the core is the former district center, the share of population in a community center is higher, reaching the maximum value of 49% in the Kamianka-Buzka community.

In general, settlements of territorial communities of the second group are poorly differentiated according to the demographic potential, and there is no distinct population-dispersion core. As a result of large area of the territory, there are threats of uneven supply of the basic services and complicated access to the community center if it is located remotely.

The third group is comprised of clusters C4, C7, C8. Cluster C8 includes the bordering Rava-Ruska and Mostyska, and also the Dobrosyn-Maheriv, Biskovychi, and Hodoriv communities. By number of population, they are the smallest in the oblast, the level of concentration of population in the center of community is also unstable, and population density is noticeably lower than the average level. In the territorial communities, there dominate small villages, and the density of settlement network is around 1.5 times higher than in the oblast average community.

Cluster C7 is mostly village communities that are in the zone of influence of the city of Lviv, and also somewhat remote communities, the centers of which are urban-type settlements and small towns. Those are Sokilnyky, Murovane, Obroshyne, Pustomyty, Kulykiv, Shchyrrets, Velykyi Lubin, Hnizdychiv, Zhudyachiv, Dobrotvir, and Sudova Vysnia communities with compact population-dispersion parameters. Their area is smaller than the average, and contains a small number of settlements. The population density is high in the suburban zone of Lviv and below the average in remote communities. In the centers of the communities, 6-10 thou people live, which – against the background of insignificant general number of population – is mostly a substantial share: from 35% in the Kulykiv community to 75% in the Sokilnyky community.

Peculiar demographic parameters are characteristic of cluster C4, which contains 23 territorial communities, including eight urban and five urban-type settlement communities. The mentioned number of population is lower than the average (without accounting for Lviv), in some even twice below that. The population density is also low, even twice lower than oblast average in some places. Settlement-network density
in most communities is above average, though small communities dominate in the settlement structure. The centers of communities are villages, or small towns and urban-type settlements, where mostly below the third of all community’s population lives. Mostly, those are territorial communities of the middle belt of Lviv Oblast, part of them having serious problems with economic and social developments, characterized by alarming demographic tendencies. The exception refers the communities that gravitate towards the Lviv agglomeration and have slightly larger settlements and better socioeconomic conditions of development.

Conclusions

Demographic parameters of territorial communities determine their financial capacity, affect specifics of management process, and are the basic preconditions for a strategy of spatial development. Demographic disproportions between the territorial communities increase threats to internal consolidation of the region and pose risks to a balanced economic development of the territories.

The concept of «demographic disproportions of administrative-territorial division» is defined as differences between territorial communities by parameters of population number, population dispersion in the central and other settlements, population density and density of settlement network, which are the result of diversity of natural-geographic conditions, population-recovery and migration processes.

The developed method of assessment of demographic disproportions between territorial communities using coefficients of deviation from average values, and also standard deviation, is based on parameters of numbers of the entire population, population of their centers, share of population living in the center of a community, population density, number of settlements, and density of settlement network.

For Lviv Oblast, found large disproportions according to population number, population density, and population of the center of a territorial community; average disproportions by area, number of populations, and density of settlement network; and small by number of population of territorial communities and population of their centers, without accounting for Lviv, and also density of population, not considering the Lviv community.

Using the method of hierarchical clustering, 72 territorial communities were united in eight clusters that in turn were united in three groups. should separately distinguish the Lviv community with the population of 790.5 thou people, which should become the foundation of the future Lviv agglomeration. According to population-dispersion parameters, the Lviv agglomeration could include the Zymna Voda village community, which is functionally connected with Lviv and is in sharp contrast to the other village communities.

The demographic disproportions between the territorial communities should be accounted for when charting out a differentiation strategy of development of Lviv Oblast by types of territories. Also, the results of the study can be used for designing special approaches to assess the ability of same-type communities and model their spatial development according to unique approaches, avoiding the standard errors. In particular, this is related to optimization of institutions of education and healthcare, centers of providing administrative services in the communities, work of public transport, and organization of municipal services.

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