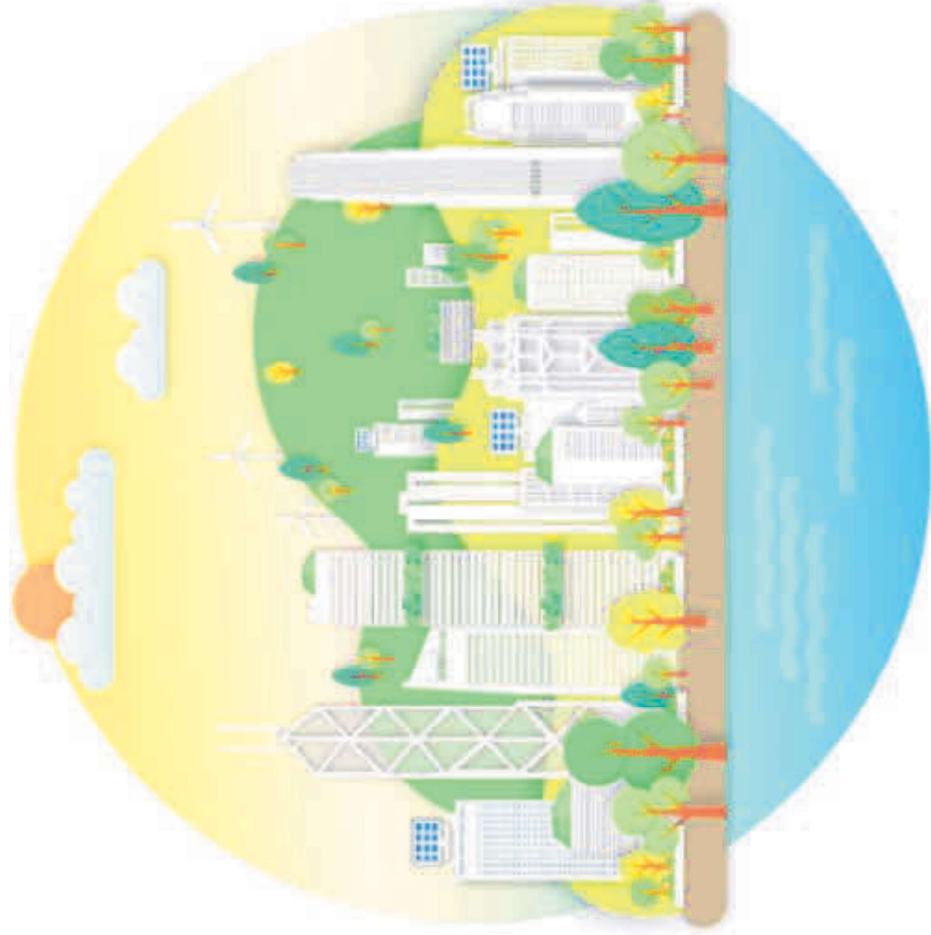


EMPOWERING COMMUNITIES: NEXUS OF INFRASTRUCTURE AND LOCAL PROSPERITY

collective monograph
ed. by Olena Omelianenko and Olha Prokopenko



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The monograph explores the intricate relationship between infrastructure development and local prosperity, emphasizing how strategically implemented infrastructure projects can unlock the potential of communities. It highlights infrastructure as not merely a collection of physical assets but as a catalyst for social cohesion, economic activity, and resilience. Addressing global challenges such as economic inequality, climate change, and urbanization, the work proposes innovative approaches to sustainable community development through inclusive planning and infrastructure solutions. Featuring empirical evidence, best practices, and actionable recommendations, the monograph underscores the importance of local stakeholder engagement and environmental responsibility in achieving social equity, improving living standards, and fostering resilient economies. For scientists, teachers, doctoral and post-graduate students, students of higher education institutions, specialists and civil servants who work in the field of formation and implementation of the infrastructure policy.

Keywords: infrastructure, local prosperity, social equity, sustainable development, community participation, climate change, innovative solutions, economic activity, social cohesion, community resilience.

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4. SOCIO-GEOGRAPHICAL FEATURES OF THE DEVELOPMENT OF THE EDUCATIONAL AND CULTURAL INFRASTRUCTURE OF SUMY REGION

4.1 Development of educational services infrastructure in Sumy region

Education is an important component of the service sector that contributes to raising the intellectual and cultural level of the population both nationally and in individual regions (Hussein, 2024). The availability of high-quality educational institutions ensures a high level of training, which affects the competitiveness of the region at the national and international levels (Akylibekova, 2024). It also helps to improve the general educational level of the population (Doschanov, 2023).

Accordingly, the availability of educational services to the population is a key condition for the successful cultural, social and economic development of regions. Educational infrastructure is important when analysing the quality of educational services. The development of educational services directly depends on the availability of educational institutions and their territorial accessibility.

According to the SOVA, as of the end of April 2023, 17 territorial communities in Sumy region are in the zone of active and possible hostilities. There are 171 educational institutions in these areas, where 25.7% of the region's students study. Currently, the majority of educational institutions in Sumy region (57.5%) have introduced a mixed form of education, with 38.7% of students studying fully remotely and 3.6% studying full-time. As a result of the hostilities, as of 12.04.2023, 26 preschool educational institutions were damaged and 13 were restored. General secondary education institutions were heavily damaged – 56, 24 were restored. The military invasion affected 10 vocational education institutions, 10 professional higher education institutions and 4 children's health and

recreation facilities. Of these, 3, 3 and 1 institutions were restored, respectively. As of 13.04.2023, 68 educational institutions needed to be restored (Kasat, 2023).

Preschool educational institutions. The first step towards the formation of a conscious, cultural personality is preschool education (Hari, 2024). In the late twentieth century and early 2000s, Ukraine experienced a significant decline in the birth rate, so most preschools were re-profiled or closed altogether. During the period of birth rate growth, problems with preschool education arose, namely the lack of institutions of this type in settlements and the number of places in the remaining institutions.

As stated in the monograph (Geography, 2021), in terms of the level of provision of pre-schoolers with preschool education institutions, Sumy region in 2020 was ranked 13th among other regions of Ukraine. The provision of preschool educational institutions was 13 institutions per 1000 people. In terms of the number of children receiving preschool education, the region ranked 20th among the regions of Ukraine (excluding the temporarily occupied Autonomous Republic of Crimea, Luhansk and Donetsk regions). As of 01.01.2020, Sumy region ranked 1st among the regions of Ukraine in terms of preschool education coverage (73% of children), including 4th in terms of urban children coverage (86% of pre-schoolers) and 7th in terms of rural children coverage (44%).

An important indicator of the development of preschool services is the number of places for children in preschool education institutions. Among other regions of Ukraine, Sumy region in 2020 ranked 10th by this indicator, including 10th place in city institutions and 8th place in rural ones.

According to statistics (Institutions, 2024), as of 2023, there were 389 preschool education institutions in Sumy region. As can be seen from the figure, the number of educational institutions before 2006 was 414 and this figure was the lowest during the study period. At the same time, from 2006 to 2012, there was a slight increase in the birth rate in the region, which is associated with several factors. Among the factors that contributed to the increase in the birth rate during this period is the fact that there were certain improvements in the socio-economic situation in the country as a whole, among the

mothers who gave birth were women born in the 1980s, when the birth rate was high and an important incentive to have children was the introduction of financial assistance after the birth of a child. Accordingly, due to the increase in the birth rate, there was an increase in the number of facilities until 2013. With the outbreak of military operations by the Russian Federation, starting in 2014, the birth rate began to decline and accordingly, the gradual closure of preschool education institutions began. As can be seen from Fig. 4.1, this process has particularly intensified in recent years, due to the fall in birth rates due to the war and mobilisation and the forced migration of the population to safer areas. In general, over the past 10 years, the number of preschool education institutions in the region has decreased by 7.3%.

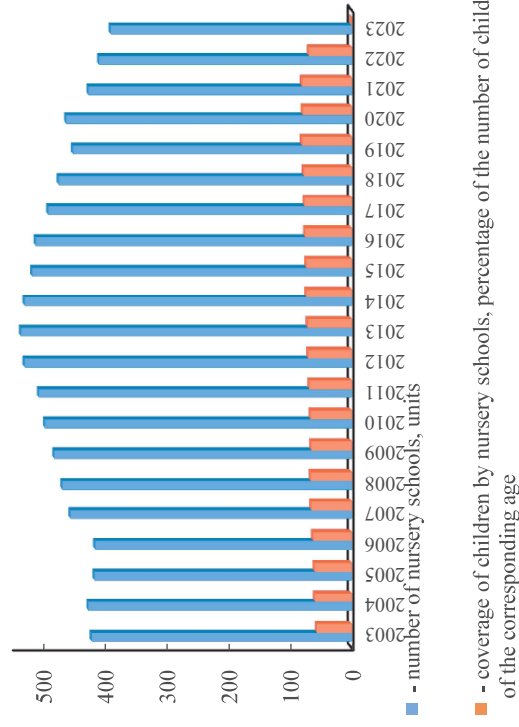


Fig 4.1. Dynamics of preschool education institutions and coverage of children by these institutions in Sumy region
Source: based on data from Preschool, 2024

As of 2022, Sumy (1.22) and Okhtyrka (1.05) districts were leading in terms of the index of territorial concentration of preschool

educational institutions in Sumy region. In 3 districts, I_c is less than 1: Konotop – 0.95, Romny – 0.98 and Shostka – 0.82. Accordingly, if we have a value less than 1, then these districts have a lower concentration of preschool education institutions compared to the average region level.

Based on the statistical data of 2022, we calculated the index of territorial concentration of preschool educational institutions in the territorial communities of Sumy region. It was found that in such communities as Buryu city community, Kyrykivka rural community, Sad village community, Dubovyazivka rural community, Nedryhailiv rural community, Shostka city community, Romny city community, Komyshe village community, Druzhba city community, Bezdryk village community, Vorozhba city community, Hlukhiv city community, Mirpillia village community, Stepanivka rural community, Sumy city community, Okhtryka city community and Konotop city community have a coefficient above 1, which indicates a high concentration of these educational institutions. According to the calculations, the lowest concentration of preschool education institutions is in Vilshana village community (0.22), Bohechky village community (0.29) and Znob-Novgorodske rural community (0.36) (Fig. 6).

When analysing preschool services, it is also worth considering such an indicator as the number of places in preschool institutions. As can be seen from Fig. 8, the availability of places in 2003-2023 was fluctuating. Until 2018, this indicator gradually increased and reached its highest value of 33 812 places. However, since 2019, there has been a decline in the number of places. This process deepened after Russia's full-scale invasion of Ukraine. As of 2023, there were 28 687 places in the region. The decrease in places is due to a decline in the birth rate and the absence of children in preschools (Fig. 4.2).

in 2014 and amounted to 37 825 children. Further, we see a gradual decrease in the number of preschool children and as of 2023, the lowest figure is recorded (Fig. 4.3).

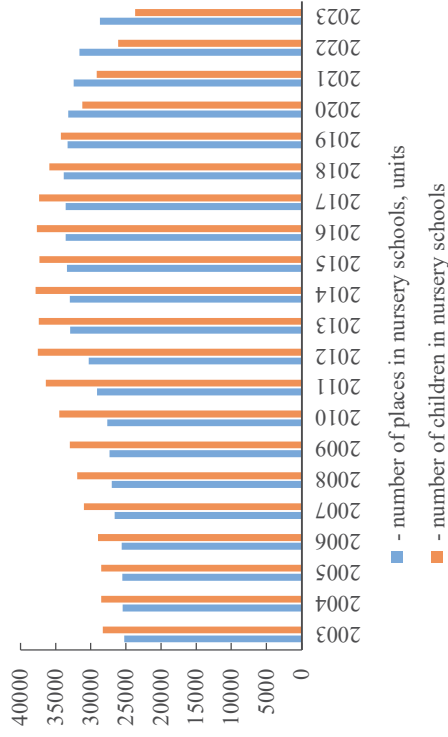


Fig. 4.3. Dynamics of the number of places in preschool education institutions and the number of children in them
 Source: based on data from *Preschool, 2024*

An important indicator of the level of development of preschool services is the coverage of children with preschool education. As can be seen from Fig. 4.3, in 2022, preschool enrolment in Sumy region was 69%, while before the full-scale war, this figure reached 80% and was the highest in the last 10 years.

One of the indicators that shows the level of development of preschool education is the social density of this type of service. The social density of services gives an idea of the territorial dispersion of educational institutions and their correspondence to the settlement network.

Analysing the social density coefficient by individual districts, we can see that in Konotop district, the highest value is observed in the Konotop city community and the lowest – is in the Nova Sloboda village community, where there are 4 preschool education

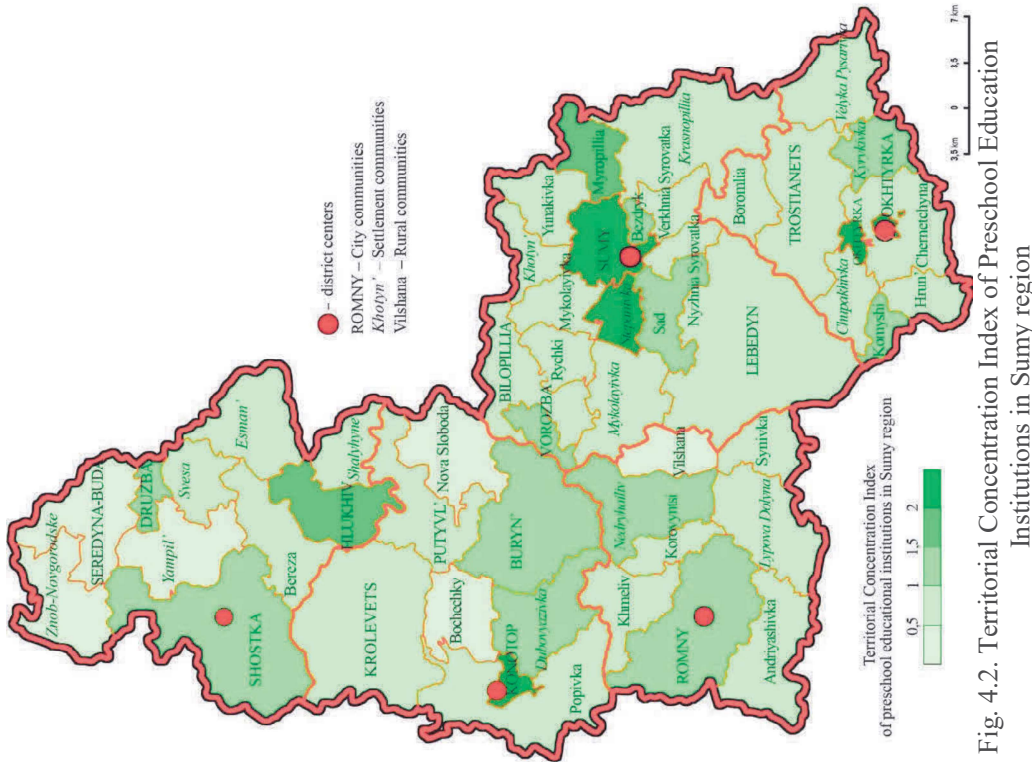


Fig. 4.2. Territorial Concentration Index of Preschool Education Institutions in Sumy region

According to statistics, at the beginning of 2023, 23 668 preschoolers were enrolled in kindergartens in the region. Analysing the dynamics of the number of children in preschool education institutions, we see that the largest number of children was registered

institutions per 37 settlements (Fig. 4.4).

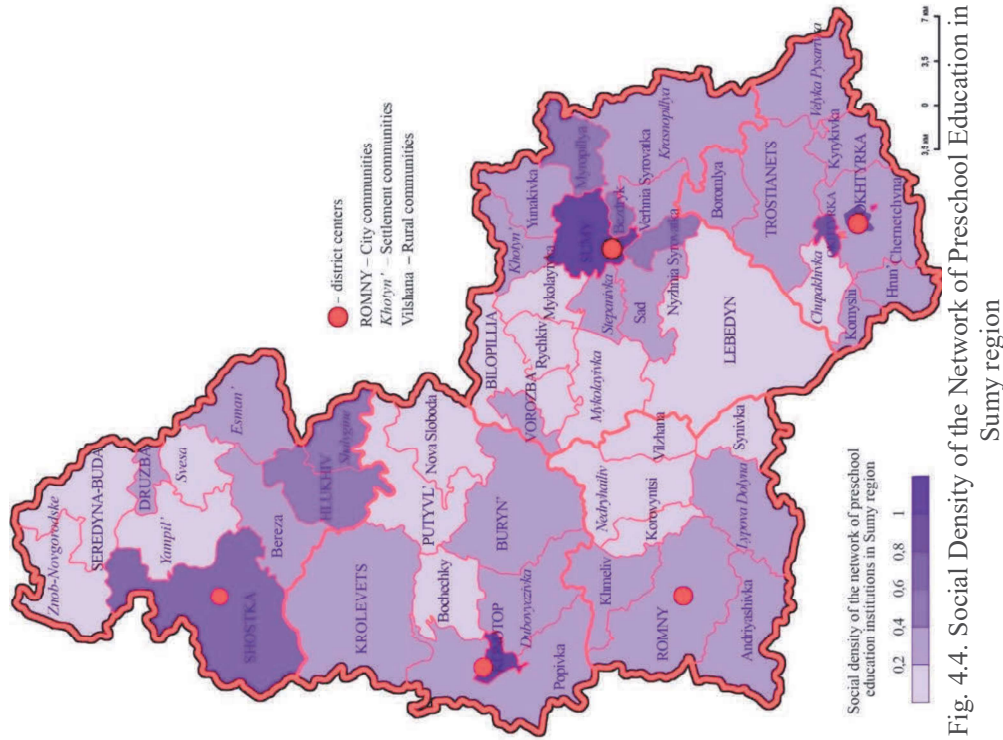


Fig. 4.4. Social Density of the Network of Preschool Education in Sumy region

In the Okhtyrka district, the highest social density ratio is observed in Okhtyrka city community and the lowest ratio is in Chupakhivka rural community, where there are 3 preschool

education institutions per 22 settlements.

For Romny district, the highest social density coefficients are recorded in Romny city andriyashivka village community and Lypova Dolyna rural community and the lowest – in Vilshana village community (1 institution per 22 settlements). In general, the social density ratio of preschool service institutions is relatively low for the communities of this district.

In the Sumy district, the highest social density ratio is observed in the Sumy city community, where there are 38 institutions per 21 settlements. Bilopillia city community has the lowest social density indicator, with only 7 preschool education institutions serving 54 settlements.

In Shostka district, Shostka city community has the highest social density coefficient and the lowest is observed in Yampil' rural community. In this community, there are 4 preschool education institutions for 32 settlements.

As we can see, the highest values of the social density coefficient of preschool services are characteristic of communities where the administrative center of the district is located.

General secondary education institutions. The Law of Ukraine “On Complete General Secondary Education” dated 16.01.2020 No. 463-IX stipulates that every child has the right to receive primary and basic secondary education in the most accessible and closest educational institution to his or her place of residence. The territorial accessibility of full general secondary education is ensured by state authorities and local self-government bodies within their powers, as is the case in many countries around the world (Ma, 2024; Fufa et al, 2024). Local governments are responsible for creating and maintaining a network of educational institutions and their branches.

As of 05.09.2021, according to the State Education Quality Service in Sumy region, there are 413 general secondary education institutions with 95 554 students (Unified, 2024).

According to statistics, in the Sumy region (General, 2024), over the past 10 years, the number of general secondary education institutions has decreased by 13.4% and the number of students by only 6.1%. It should be noted that in the 2020/21 academic year, the largest number of students studied in these institutions – 98.7

thousand people. This was followed by a decline in the number of students, which intensified during the war, due to forced migration to safer regions of Ukraine and people leaving the country. In the 2023/24 academic year, 92.5 students were enrolled in these institutions (Fig. 4.5).

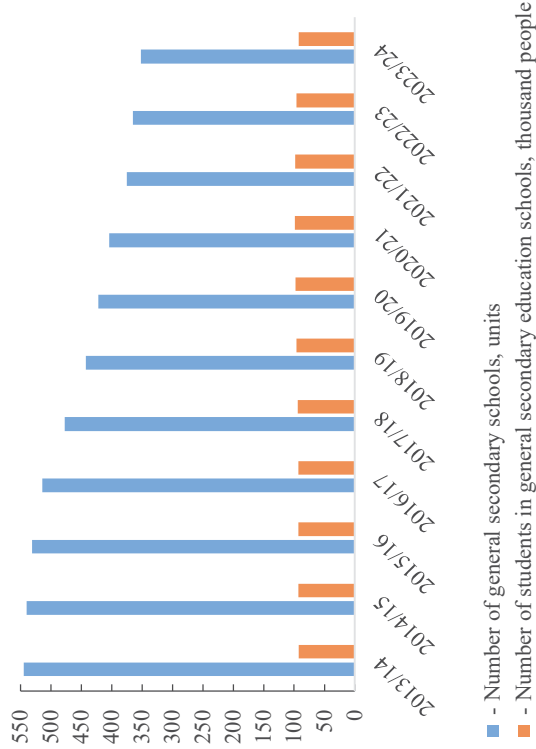


Fig. 4.5. Dynamics of the Number of General Secondary Education Institutions and the Number of Students in them (based on data from General, 2024)

Taking into account the fact that during the period of martial law the state statistics authorities suspended the publication of statistical information, the data from the Unified State Electronic Database on Education was used to analyse the territorial features of general secondary education institutions (Unified, 2024). According to this data, there were 414 educational institutions in the region at the beginning of the 2021/2022 school year. Among the districts, the largest number of them was in Sumy district. The fewest institutions provided educational services in Romny and Okhlyrka districts (Fig. 4.6).

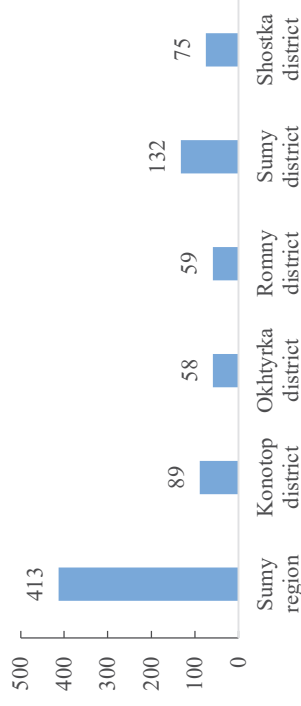


Fig. 4.6. Number of General Secondary Education Institutions in Sumy Region at the Beginning of the 2021/2022 academic year
Source: Unified, 2024

To assess the saturation of general secondary education institutions in different districts of the Sumy region and to determine whether the number of educational institutions corresponds to the existing settlement network, the territorial concentration index and the social density coefficient of these institutions were calculated (Fig. 4.11). As can be seen from Fig. 4.1, Sumy and Okhlyrka districts have a territorial concentration index above 1.0, which indicates the optimal location of institutions in these districts. The social density indexes in terms of districts are approximately at the same level of 0.2-0.3.

In Konotop district, Konotop city community has the highest I_{ec} , with 14 general secondary education institutions per 4 settlements. In all other communities of the district, this indicator is below 1.0 (Fig. 4.7). The lowest I_{ec} is in the Bochechky village community.

In the Okhlyrka district, Komyshe village community and the Okhlyrka city community have a higher I_{ec} than one; the lowest is in Chupakhivka rural community.

Among the communities of Romny district andriyashivka village community and Romny city community have an I_{ec} above one, while Vilshana village community has the lowest score among the communities of this district.

In Sumy district, the following communities have an index

above 1.0: Bezdryk village community, Bilopillia city community, Vorozhba city community, Mykolaivka village community, Miropillia village community, Sad village community, Stepanivka rural community and Sumy city community. Lebedyn city community has the lowest I_c value, with 19 general secondary education institutions per 125 settlements.

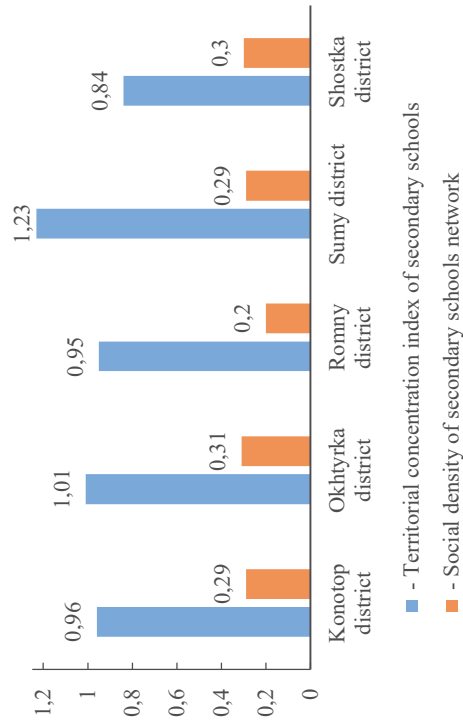


Fig. 4.7. Territorial Concentration Index and Social Density of Secondary Schools Network

Analysing the situation with the territorial concentration of general secondary education institutions in Shostka district, three communities have an indicator above 1.0. This includes 3 city communities: Hlukhiv, Druzhba and Shostka. Znob-Novgorodske rural community has the lowest indicator, where there are only 3 general secondary education institutions for 29 settlements (Fig. 4.8).

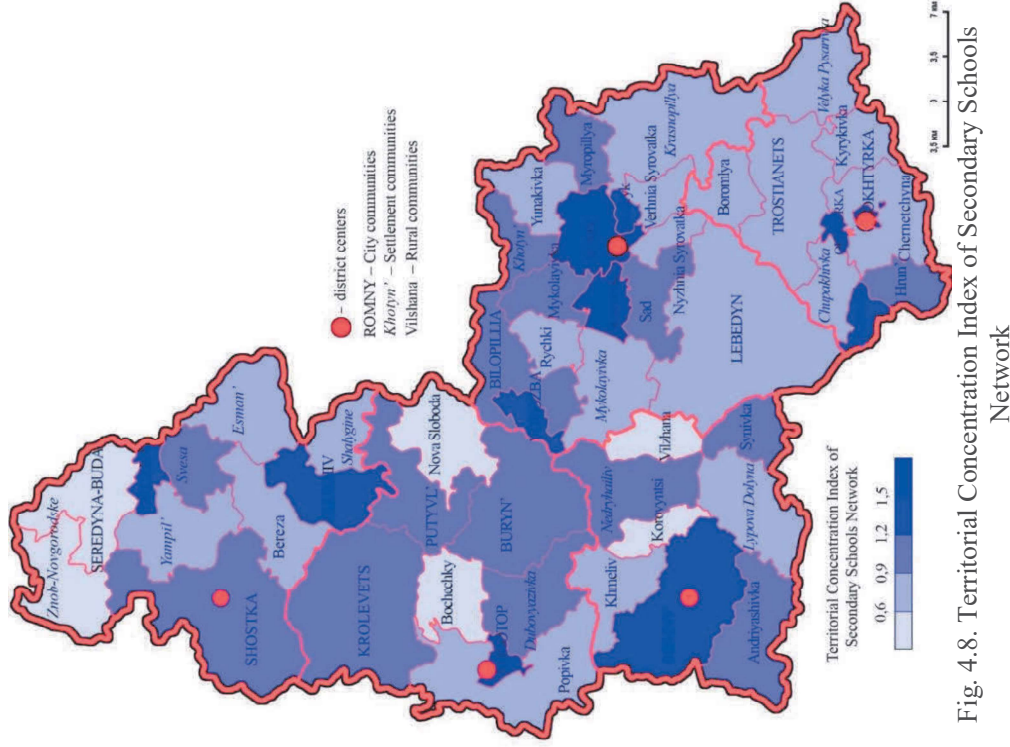


Fig. 4.8. Territorial Concentration Index of Secondary Schools Network

To study the level of development of general education in the region, we also calculated the social density of services. The social density analysis allows us to identify areas with insufficient service provision and direct resources to create new social infrastructure facilities there. This helps to ensure more equal access to necessary

services for all citizens, regardless of their place of residence. This indicator is important for planning and managing territories. It can be used to make decisions on the construction of new schools, hospitals, cultural centers, transportation infrastructure, etc. The calculation of the social density of services allows us to take into account the social aspects of the development of territories, ensuring fair access to services for different groups of the population, including vulnerable categories (pensioners, people with disabilities, children). Regular monitoring of the social density of services helps to assess the dynamics of changes in the quality of life in different regions. This is important for making strategic decisions to improve the living conditions of the population.

This indicator is calculated using the following formula:

$$SD = \frac{EI}{PA}, \quad (4.1),$$

where SD – is the social density of the network of educational institutions; EI – is the educational institutions; PA – is the populated areas.

If one district has a low social density of educational institutions (e.g., few schools), this may indicate the need to build new schools or reconstruct existing ones to meet the needs of the population. Thus, the calculation of the social density of services is an important tool for ensuring accessibility, equal distribution of resources and improving the quality of life of the population.

This indicator allowed us to assess how accessible social services are to the population in different territorial units. According to our calculations, 25 communities have a low social density of Secondary Schools Network. As you can see from the figure, only Sumy city and Konotop city communities have a social density above 1.0. Okhnytka city community also has a coefficient of 1.0 (Fig. 4.9).

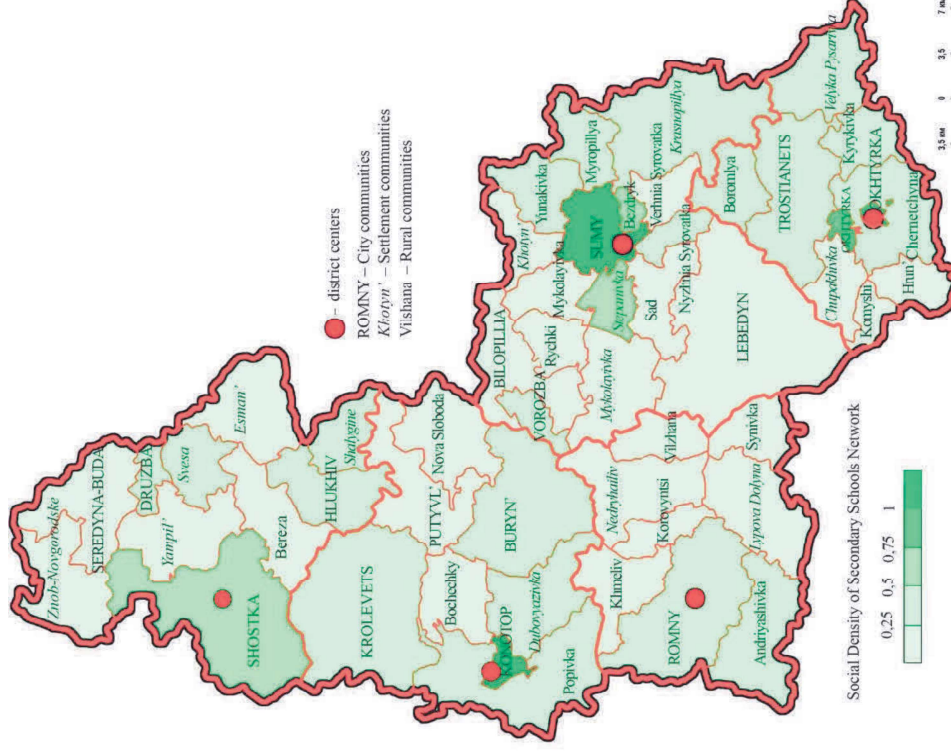


Fig. 4.9. Social Density of Secondary Schools Network

Extracurricular education provides for the development of interests, abilities and talents of children and young people outside of general education. It includes a variety of educational programs, sections, circles, clubs and courses aimed at the comprehensive development of the individual.

The main goal of out-of-school education is to ensure the harmonious development of a child's personality, creativity and intellectual and physical abilities, as well as to promote social skills and civic consciousness formation. It helps to educate a person who can actively participate in society, think critically, work in a team and take initiative. It helps to identify professional interests and future career choices by allowing children to try out different roles and areas of activity, which can influence their future career choices.

The role of out-of-school education should be reassessed. As noted in the article by S. Londar et al. (Londar, 2023), in the conditions of war, it is the out-of-school education institutions in all regions of Ukraine that have been working to create all possible conditions for the availability of such education to children from families who have found themselves in difficult life circumstances due to the war. In most regions, it is the out-of-school time that has taken on the responsibility of distracting children from the terrible everyday life of war. The educational potential of out-of-school education is considered by Ewa Kochanowska (Kochanowska, 2023).

It should be noted that the level of development of out-of-school education before the war was quite high. Thus, according to the results of the monitoring of the socio-economic development of regions in 2018 in the area of "Accessibility and quality of services in the field of education", Sumy region took 6th place (Sumy, 2019). According to one of the indicators in this area, namely "The proportion of children covered by out-of-school education, as a percentage of the total number of school-age children" Sumy region took the 2nd place, as almost 65,550 pupils of the entire region studied in creative associations of out-of-school education, which is 94.8% of school-age children. To ensure the right of every child to identify and develop creative abilities, 83 out-of-school educational institutions operated in the region.

However, it is worth noting that, according to the Ministry of Education and Science (Network, 2023), over the past three years, the network of out-of-school education institutions in Ukraine has decreased by 10% – from 3916 in 2021 to 3501 as of January 1, 2023. This trend is due to several factors: in the process of

decentralization, out-of-school education institutions are being liquidated or reorganised (through mergers or acquisitions); rural territorial communities in most cases do not have the financial capacity to create.

In 2020, the number of out-of-school education institutions in Sumy region also decreased. According to the data (Public, 2020), 80 out-of-school education institutions provided out-of-school education in the region, including 54 out-of-school education institutions (centers, houses, palaces of children's and youth, scientific and technical creativity, aesthetic education, stations of young naturalists, tourists, military-patriotic clubs, art schools) and 26 children's and youth sports schools. In 3 023 clubs and 695 sports groups, 59 052 pupils received out-of-school education, which is 60% of the total number of students in educational institutions.

As of January 1, 2024, according to (Out-of-school, 2019; Out-of-school, 2024; Ukraine, 2024) in the Sumy region, out-of-school education services were provided by an extensive network of institutions. In terms of districts, the largest number of institutions operates in Shostka district – 15. In Romny district, 8 institutions provide out-of-school education, in Konotop district – 16, in Sumy district – 14, in Okhtyrka district – 11 and in Sumy city – 5 institutions.

Vocational education. Vocational education is aimed at training skilled workers and middle managers who can work in various sectors of the economy. It provides the acquisition of practical skills and knowledge necessary to perform professional duties at work, in institutions or organisations. The development of vocational education is of great importance for the region, as the availability of diverse professionals contributes to economic growth and social stability, which can be seen in many countries (Shrama et al., 2024).

Vocational education can be seen in many countries which provides basic vocational skills focused on a specific working profession. Graduates are usually qualified as workers or junior specialists and can start working after graduation. Given the fact that the country is at war and the Sumy region is constantly suffering from enemy attacks that destroy both industrial and social

infrastructure, there is a growing need for skilled workers in various fields such as industry, construction, agriculture, services, etc.

In 2023, 5.3 thousand people were enrolled for training, which is 11.5% more than in 2022. It should also be noted that almost 5 thousand students graduated this year (Press, 2024).

As can be seen from the graphs (Fig. 4.10), over the past 10 years, the number of vocational education institutions has decreased by 17.6% and the number of students in these institutions has decreased by 38.1%.

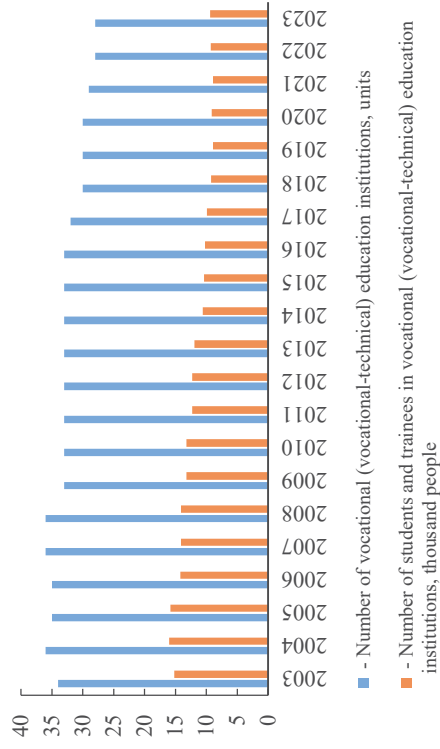


Fig. 4.10. The vocational (vocational-technical) education institutions in Sumy region

According to the Register of Educational Institutions (Register, 2024), vocational education was provided by 28 educational institutions located in different districts of the region and the regional center. Thus, in the city of Sumy, educational services were provided by 8 vocational schools, 3 institutions in Sumy district, 5 in Romny district, 3 in Konotop district, 2 in Okhtyrka district and 7 in Shostka district.

Vocational pre-university education provides training for middle-level professionals who occupy an intermediate position between workers and specialists with higher education. Graduates receive a junior specialist or professional bachelor's degree, which

allows them to work in more complex positions or continue their studies in higher education. At the beginning of the 2023/2024 academic year, there were 9 higher education institutions in Sumy region with almost 13 thousand students. It is also possible to obtain professional higher education in 13 separate structural subdivisions of higher education institutions (Table 4.1). In 2023, 5.3 thousand people were enrolled (Press, 2024).

Table 4.1. Institutions of professional higher education (Institutions, 2024)

	Number of Institutions of professional higher education, units	Number of people in the Institutions of professional higher education, thousand	Number of people enrolled in Institutions of professional higher education, thousand	Number of persons released from Institutions of professional higher education*, thousand
2020/21	8	9.0	2.9	2.5
2021/22	9	10.9	3.9	2.9
2022/23	9	11.3	4.2	3.1
2023/24	9	12.8	5.3	3.1

* At the end of 2020, 2021, 2022, 2023.

As shown in the table 4.1, the number of students in professional higher education institutions is gradually increasing. This can be explained by many factors, including the fact that this education is focused on training mid-level professionals with practical skills that are immediately in demand in the labor market. This makes education attractive to those who want to start a career quickly without spending many years obtaining a higher education. In addition, vocational higher education institutions often offer more affordable study conditions than universities, including lower tuition fees. In addition, the labor market is always in high demand for mid-level specialists in various fields, such as technical specialties, medicine, agriculture, services, etc. Another "bonus" is that

graduates have the opportunity to continue their studies in higher education institutions with a reduced period of study. This makes vocational pre-university education attractive for those who want to first obtain a specialty and then pursue higher education.

In terms of administrative units, the largest number of higher education institutions is registered in Sumy – 4 independent institutions and 3 separate structural subdivisions – Sumy State University, National University of Food Technologies, Sumy National Agrarian University. In Sumy district, professional higher education is provided by 2 municipal institutions and 1 separate structural subdivision of Sumy National Agrarian University. In Konotop district is represented by 2 municipal institutions, 2 separate structural subdivisions of Sumy State University and 1 separate structural subdivision of Sumy National Agrarian University. In Shostka district, professional higher education is provided by 2 municipal institutions and 3 separate structural subdivisions – Sumy State University, Hlukhiv Oleksandr Dovzhenko National Pedagogical University and Sumy National Agrarian University. In Okhnyrka district, professional higher education can be obtained at a separate structural subdivision of Sumy National Agrarian University. Romny district provides educational services for professional higher education in separate structural subdivisions of the Kyiv National Economic University named after Vadym Hetman and Sumy National Agrarian University.

Higher education in Sumy region. At the beginning of the 2023/2024 academic year, 23 thousand students were enrolled in 6 higher education institutions in Sumy region. 9.3 thousand people were admitted to study and more than half of them started their studies for the first time (Table 4.2). In 2023, 3.6 thousand people graduated. As of the beginning of 2024, 1532 postgraduate students were studying at the appropriate level in 5 scientific institutions of the region (Press, 2024).

As can be seen from the table 4.2, the number of students pursuing higher education has increased in recent years. There are many reasons for this, such as the fact that higher education in Ukraine is increasingly perceived as a necessary element for a successful career and social status. Many professions in the labor

market require a university degree. In some professions, higher education provides access to higher earnings and social guarantees, which is a significant incentive for many young people. Opportunities for admission to higher education institutions have been expanded, in particular by increasing the number of educational programs and introducing distance and part-time study. In addition, many universities offer flexible forms of tuition fees or benefits for certain categories of students. In today's competitive labor market, higher education is seen as a way to gain additional knowledge, skills and qualifications that can increase the chances of successful employment and career growth. The demographic situation is also worth mentioning, as the generation born in the early 2000s has reached the age of university admission and this generation is numerically larger than previous ones. This also affects the growth in the number of students. Thus, the growth in the number of students pursuing higher education is the result of both socio-economic and educational changes that have taken place in Ukraine in recent years.

Table 4.2. The higher education institutions

	Number of higher education institutions, units	Number of people in higher education institutions, thousand	Number of people admitted to higher education institutions, thousand	Number of people who graduated from higher education institutions*, thousand
2020/21	7	18.9	4.7	8.4
2021/22	6	18.1	3.8	4.3
2022/23	6	19.2	4.9	5.4
2023/24	6	23.0	5.0	3.6

* At the end of 2020, 2021, 2022, 2023.

As indicated in the Register of Educational Institutions (Register, 2024), higher education institutions are mainly concentrated in Sumy. These include Sumy State Pedagogical University named after A. S. Makarenko, Sumy State University and Sumy National Agrarian University. Higher education is also provided by Sumy Regional Institute of Postgraduate Pedagogical Education, Sumy Branch of National University of Food

Technologies and Sumy Branch of Kharkiv National University of Internal Affairs. In Hlukhiv, there is Hlukhiv National Pedagogical University named after Oleksandr Dovzhenko. Higher education can also be obtained at Shostka and Konotop Institutes of Sumy State University.

Thus, education plays a crucial role in raising the intellectual and cultural level of the population, which contributes to the cultural and socio-economic development of the regions. Accessibility of educational services is an important condition for this process. The hostilities in Sumy region have hurt education. First of all, educational institutions, especially those located near the border, have suffered from the hostilities. This negatively affected the educational infrastructure and accessibility of educational services. As of April 2023, a significant number of institutions needed to be restored. Declining birth rates and hostilities have led to a reduction in the number of preschools, which exacerbates the problem of organising preschool services, especially in rural areas. In many village communities, the number of institutions is insufficient, creating problems with access to preschool education.

Out-of-school education is an important element in the development of children and youth, ensuring the comprehensive development of their interests, abilities and talents. It is aimed at the harmonious development of the individual, helps to form social skills, civic awareness and helps to identify professional interests. Despite the high level of development of extracurricular education before the war, current conditions require a rethinking of its role. During the war, out-of-school education plays a particularly important role in supporting children in difficult life circumstances. However, in recent years, the network of out-of-school education institutions has shrunk, which is a cause for concern and requires additional attention from the state and local communities to ensure the availability and quality of such services.

General secondary education institutions in Sumy region provide basic education for children, but in recent years there has been a downward trend in the number of such institutions and students. This decline has become even more pronounced due to the forced migration of the population during the war. The indices of

territorial concentration and social density show an uneven distribution of educational institutions in different communities of the region, which affects the accessibility of education for children in remote areas. Particularly low accessibility rates are observed in rural communities, where the number of institutions is insufficient to meet the needs of the local population. This emphasises the need for further development of the network of general secondary education institutions, taking into account territorial features to ensure equal access to quality education for all children in the region.

Vocational education is key to training skilled workers and mid-level professionals who are essential for the development of the region's economy. Given the challenges faced by Sumy region due to the war, there is a growing need for such specialists, especially in the industrial, construction, agricultural and service sectors. Despite the decline in the number of institutions and students in recent years, vocational education continues to play an important role in providing the region with the necessary personnel. In 2023, the number of students enrolled in vocational education increased, indicating an increased demand for such education under martial law.

Professional higher education institutions are also gaining popularity, as evidenced by the gradual increase in the number of students. These institutions provide training for mid-level professionals whose practical skills are in demand in the labor market. The attractiveness of this education is enhanced by the affordability of the learning environment and the possibility of further education in higher education institutions. Thus, both vocational and professional higher education play an important role in training personnel that contribute to the recovery and development of the region's economy.

Sumy region is experiencing an increase in the number of students pursuing higher education due to several socio-economic and educational factors. The demand for higher education is growing due to the requirements of the labor market, where a university degree is often a prerequisite for successful employment and career growth. Expanding enrollment opportunities, the introduction of distance and part-time learning and flexible forms of tuition fees make higher education more accessible. The demographic situation

is also having an impact, as the generation born in the early 2000s is actively enrolling in universities. Higher education institutions are mainly concentrated in Sumy, making the city the key educational center of the region.

In general, the need to restore and develop educational services in the context of war is critical to ensure the availability of social services and further socio-economic development of the region.

4.2 Cultural services for the population of Sumy region

The current trends in the development of territorial communities, which began to take shape at the end of 2020 as part of the reform of the territorial organisation of power and local self-government in Ukraine, have exacerbated the issue of forming the provision of services to the population by cultural institutions and the organisation of geocultural space in general. This is because today, along with increasing requirements for the quality and accessibility of socio-cultural services to residents of the territorial community, the importance of their content is growing. Along with measures to implement a coherent national cultural policy, it is also important to preserve and popularise local distinctive culture. These tasks can be achieved by preserving and developing a network of cultural institutions that form the supporting framework for the socio-cultural development of the territorial community and the residents of the region as a whole (Zadvornyi, 2020).

The basic network of cultural institutions consists of two levels – national and local. This study of the sociocultural sphere of Sumy region covers local level institutions. The main requirements for the formation of cultural institutions by executive authorities and local self-government bodies are defined by the Procedure for the Formation of the Basic Network of Cultural Institutions, approved by the Resolution of the Cabinet of Ministers of Ukraine of October 24, 2012, No. 984 (as amended by the Resolution of the Cabinet of Ministers of Ukraine of September 15, 2021, No. 970 and of December 01, 2023, No. 1261) (On Approval, 2021). According to

this Procedure, the basic network of the local level includes municipal cultural institutions (libraries, museums, galleries, reserves, exhibition halls, theaters, philharmonic societies, concert organisations, artistic groups, cinemas, film and video distribution enterprises, associations, palaces and houses of culture, other clubs, studios centers of folk art, centers of folk culture, cultural service centers, parks of culture and recreation, etc.), cultural educational institutions (art schools, art lyceums, professional art colleges, higher art education institutions), the lists of which are approved by local executive authorities and local self-government bodies.

As indicated in the monograph (Geography, 2021), before the war in 2020, the socio-cultural services of the region were represented by 1179 cultural institutions, including: 591 club institutions, 530 libraries, 36 art schools, 13 state museums, 37 public museums, a national reserve and 2 state historical and cultural reserves, 2 theatres, a philharmonic, a regional scientific and methodological center for culture and arts and the D.S. Bortnyansky Professional College of Arts and Culture. The cultural institutions employed 4605 people. Between 1980 and 2020, the number of cultural institutions decreased. In particular, during this period, the number of libraries decreased by 39.5% and the number of clubs decreased by 56.8%. Over the past 10 years, the rate of decline has slowed. Thus, the number of libraries decreased by 5.2% and the number of clubs by 6.8%.

The processes of decentralisation and the formation of territorial communities have influenced the development of cultural services. Today, communities have virtually completed the formation of basic networks of cultural institutions, primarily in the form of a core cultural or artistic institution (house of culture, center of culture and art, public library, etc.) and its branches operating in the community's settlements. The main focus is on supporting the institutions of the core network; theoretically, the main goal of this process is to ensure effective and comprehensive cultural and artistic development of settlements. However, the specifics and realities of the war, the shortcomings of the post-reform decentralisation period and the rapid depopulation characteristic of Sumy region are increasingly highlighting the need to optimise such networks. In this

context, to ensure the optimal development of cultural services for the population of communities, it is extremely important to study this issue from a socio-geographical perspective.

Elements of the functioning of the basic network of cultural institutions are closely linked to the development of strategic community development plans, socio-economic development programs and sectoral programs in the field of culture and art. Today, different communities are working on optimal models for ensuring the sustainable functioning of the basic network of cultural institutions. Particular diversity in this area can be observed in urban communities, especially those formed based on city councils of former cities of oblast subordination and the oblast center and including suburban settlements.

According to the current administrative-territorial structure, Sumy region is divided into 5 districts covering 51 territorial communities. The latter, in turn, are divided into starostynskiy districts, the number of which practically corresponds to the pre-reform composition of village councils that participated in the voluntary amalgamation. Lebedyn, Krolevets and Shostka city territorial communities are the largest in terms of area (over 1200 km²), with boundaries that coincide with the former districts of the same name that existed before the 2020 administrative reform. Communities formed around other cities of region subordination are much smaller in area (Okhtyrka city community is the smallest in general and also consists of three separate enclaves). At the same time, most of the region's population is concentrated here (25.58% of Sumy Oblast inhabitants live in the community, while its share in the region's area is only 1.51%). Konotop community has 8.68% and Okhtyrka community has 4.56% of the population of Sumy region, while they account for 0.44% and 0.36% of the total area of the region.

As of the beginning of 2022, the basic network of local cultural institutions of the territorial communities of Sumy region consisted of 1106 units in communal ownership (Table 4.3).

Table 4.3. Cultural institutions of the basic network at the local level in Sumy region

Administrative district	Number of cultural institutions in the core network
Konotop	230
Okhtyrka	148
Romny	224
Sumy	293
Shostka	211
<i>Total</i>	<i>1106</i>

To characterise the component structure of the sphere of culture and art of communities, we have identified the following types of institutions: houses (centers) of culture, clubs (including branches), leisure facilities (points), libraries (including branch libraries), music (art) schools, museums (Fig. 4.11).

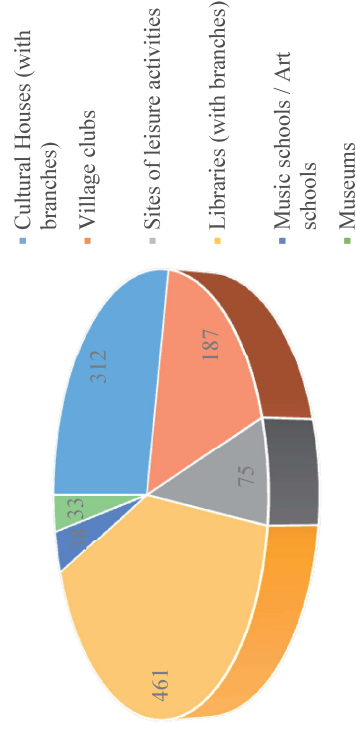


Fig. 4.11. The structure of the basic network of cultural institutions in Sumy region by their type (units) as of January 1, 2022

The most common component of the network of cultural services for the population in Sumy region is club-type institutions: palaces (houses, centers) of culture (leisure) and clubs. In total, there

are 499 of them (including branches), which is 45.1% of the total number of institutions in the basic network. The main purpose of these institutions is to promote the development of amateur creativity, organise cultural events, educate children and youth, provide meaningful leisure activities, organise cultural and educational events of a spiritual and patriotic nature and hold various festivals and concerts. It should be noted that these institutions have more than 300 clubs: 236 of them have the title of “folk” and “exemplary” (Annex A). Every year they organise several hundred cultural events on a wide range of topics (Table 4.4).

Table 4.4. Typological structure of the basic network of cultural institutions of administrative districts of Sumy region (as of January 1, 2022)

Administrative district	Houses of culture (with branches)	Rural clubs of club type	Leisure facilities	Libraries (with branches)	Music schools / art schools	Museums
Konotopsky	63	35	7	108	6	11
Okhtyrka	53	35	2	51	4	3
Romny	58	45	19	91	7	4
Sumy	89	36	25	122	13	8
Shostka	49	36	22	89	8	7
<i>Total</i>	312	187	75	461	38	33

Library institutions are the second largest in the system of the basic network of cultural institutions, with a share of 41.7%. Due to decentralisation and the creation of territorial communities, the geography of library services in the region has undergone dramatic changes. The network of public libraries in the communities is organised taking into account the Minimum Social Standards for the provision of public libraries in Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine of 30.05.1997 No. 510. The standards for library services are as follows (Kornus, 2012): in settlements with up to 500 inhabitants, by decision of the relevant local self-government body, library services are provided by a public

library or through non-stationary forms of service (library point, mobile library). In settlements with a population of 500 to 3 thousand people, there should be at least one public library on the territory of the village (rural) council; in settlements with a population of more than 3 thousand people, there should be one library per 3-5 thousand people.

The number of city libraries is determined by the population density and the number of storeys of buildings:

1. In residential areas with multi-storey buildings (8 or more floors), one library per 15-20 thousand people;
2. In residential areas with low-rise buildings (1-3 floors) – one library per 5-8 thousand people. To serve children and youth in cities with a population of up to 75 thousand inhabitants, there should be at least one library for children for 8-12 schools, in cities with a district division, one library for children in each administrative district. In the regional center, there is a regional library for children as a research, information and advisory center on the cultural development of children.

3. In the regional center, there is a regional universal scientific library, which is the main institution in the field of library and information services for the population, a research, methodological, coordination center for libraries of all systems and departments of the region, a central regional book depository, a regional depository of local history literature, a center for book exchange and interlibrary loan (Kornus, 2012).

Public libraries have been established in almost all community centers in the region as municipal institutions and centralised library systems have been established in district centers. In addition to providing traditional services to readers, libraries are becoming more than just a book collection. In many cases, they are multifunctional modern open centers and sometimes even entire information and resource platforms with book, newspaper and magazine collections, meeting rooms, cafes and children's rooms, such as the Trostianets Public Library, which has become a modern multimedia, educational, cultural and information space. Such institutions are more attractive to users.

Of course, the number of libraries alone cannot give a

complete picture of the level of library services in the district and the region as a whole. This level depends not only on the development of the network of libraries and their territorial features, the availability of book collections and their correlation with the population. Meeting the needs of readers also depends on the concentration of books in libraries and their diversity. These institutions should contain literature of different genres to meet the needs of different segments of the population. Libraries with a book collection of more than 10 thousand copies usually have more diverse literature. In city libraries, the library collection is almost equal to that in village libraries, although the number of libraries in rural areas is higher than in cities.

Leisure institutions perform similar functions to clubs and sometimes they also have a library that is not part of the community library network.

Primary art education is represented by 38 music (art) schools (including branches). The largest number of them is in Sumy district, where such schools operate in Bilopillia, Vorozhba, Krasnopillia, Lebedyn, Mykolaivka rural, Sad, Stepanivska and Sumy (5 schools) communities. The main purpose of this type of institution is to develop children's creative abilities and talents, to teach them practical skills, to acquire knowledge of national and world culture and art and to acquire special artistic performance competencies.

A significant addition to the basic network of community cultural institutions are national and regional cultural institutions engaged in similar or related activities. Here, first of all, it is worth noting the Hlukhiv National Reserve. The same category includes regional institutions that are in the communal ownership of the Sumy Regional Council. They are represented by 2 academic theaters: Sumy Regional Academic Theater for Children and Youth, Sumy National Shepkin Theater (granting the latter national status in 2020 did not change the registration of the theater as a municipal institution of the Sumy Regional Council), 2 libraries (universal scientific and children's), 3 museums (Sumy Regional Museum of Local Lore, Sumy Regional Art Museum named after N. Onatskyi. Onatsky, the A.P. Chekhov Memorial House-Museum in Sumy), the Philharmonic, the Sumy Regional Scientific and Methodological

Center for Culture and Arts and the Sumy Professional College of Arts and Culture named after D.S. Bortnyansky. The above institutions, on the one hand, create competition for municipal institutions within the framework of commercial activities and on the other hand, reduce the burden on the basic network of territorial communities.

The functioning of cultural institutions and the implementation of measures to implement a consistent cultural policy are ensured by the existence of specialised structural units of management and administration in the system of executive committees of territorial communities – departments of culture, which often combine administration in related fields – education, tourism, sports, youth policy, etc. Currently, the organisational and managerial mechanism of the network of institutions meets the requirements for fulfilling functional tasks and innovative development of the sector.

The territorial organisation of cultural institutions at the local level of communities in Sumy region is an orderly network that is directly dependent on the population of the settlement and its administrative status. In general, according to the results of the socio-geographical analysis, we can distinguish 4 hierarchical levels of cultural and artistic systems: regional, district, basic (community) and primary (starosta). These systems correspond to the classical approach to their allocation, which is common in social and cultural geography (Zadvornyi, 2016).

Based on the above, we have identified one regional cultural and artistic center. It is formed based on the administrative center of the community and the region – the city of Sumy, which is characterised by a pronounced functional core. It has been assigned the highest rank, given the presence of all types of institutions here, the location of municipal cultural institutions at the regional level and the management bodies of the sector. The institutions of the basic cultural service network of the Sumy city community, such as the Sumy Municipal Gallery, are also visited by residents of other communities.

The next hierarchical level is the district level. All districts' centers today are also centers of territorial communities, but they have a greater number of cultural institutions than just city

communities. In particular, there is a local history museum and sometimes several municipal museum-type institutions, a centralised library system, etc.

In the rural areas of the region, 640 institutions (57.9%) of the basic network of cultural services are concentrated. Accordingly, they form 2 levels of cultural and artistic systems: basic (community) and primary (starosta). The centers of the latter are the administrative centers of starosta districts, where a branch of a house of culture (club) and a branch library are usually located.

The geographical specificity of the location of elements of the basic network is reflected in the indicators of the provision of administrative-territorial units of the region with cultural and art institutions (Table 4.5).

Table 4.5. Provision of cultural institutions to the basic network of territorial communities by administrative districts of Sumy region

Administrative district	Number of institutions per 10 km ² of area	Number of institutions per 100 inhabitants
Konotop	0.44	1.14
Okhtyrka	0.48	1.22
Romny	0.48	1.17
Sumy	0.56	0.34
Shostka	0.42	1.26
<i>By region</i>	0.48	1.06

The number of institutions per 10 km² of area is highest in Romny – 0.68 institutions per 10 km² and Sumy – 0.56 institutions per 10 km². In other districts, it is lower than 0.5 institutions per 10 km² and in the region as a whole it is 0.48 institutions per 10 km². In terms of territorial communities, the highest density of cultural institutions of the basic network – more than 1 per 10 km² – is concentrated in Konotop city, Okhtyrka city and Stepanivka rural communities: 1.39, 1.34 and 1.08 institutions per 10 km², respectively. It is most sparse in Bochechky village, Berezivka village, Buryń city communities – 0.28 per 10 km² each and Boromlya village community – 0.26 institutions per 10 km².

In terms of the number of institutions per 1000 inhabitants, Znob-Novhorodske rural community stands out, while Khmelivka

village, Vilshany village, Esman rural andriyashivka village, Myropillia village, Dubovyazivka rural and Synivka village communities have a high number of cultural service institutions per 1000 inhabitants – more than 3 institutions per 1000 inhabitants. This list includes 4 communities from the Romny district, where the provision of the population with cultural institutions is the highest – 2.08 institutions per 1000 people.

Sumy district, which is distinguished by its population size, was expected to be among the least well-supplied in this regard, with 0.34 basic cultural institutions per 1000 people. The same can be said for other communities with a large number of residents: Okhtyrka, Konotop and Sumy city (0.23, 0.16 and 0.09 institutions per 1000 people, respectively) (Fig. 4.12).

For a detailed study of the coverage of the territory of the amalgamated communities by cultural institutions, we calculated the coefficients of their territorial concentration by calculating the corresponding index. A value of I_c less than 1.0 indicates a low concentration of the studied indicator in a particular community; if the value is close to 1.0, we can talk about the location of cultural service institutions at the average regional level; above 1.0 – about a high saturation of such institutions compared to this indicator.

As we can see, as a result of decentralisation, the cultural and artistic sphere of Sumy region has become territorially disproportionate. Various factors contributed to this, for example, when a community operates within the territorial boundaries of one former administrative district (one district then – one community today), or when a “united” community was formed by settlements of only two former councils. This resulted in communities that differ significantly in size. For example, the area of the largest community, Lebedyn city and the smallest Okhtyrka city, differ by more than 20 times. At the same time, the former includes 125 settlements and the latter – 11. Understandably, such small communities will have high values of the I_c , as in this example for Lebedyn and Okhtyrka communities – 0.70 and 2.78, respectively.

In general, the highest values of the I_c are typical for the communities of Romny district and the lowest – for Shostka district.

Given the peculiarities of service provision by cultural

institutions, it is more important to determine whether the location of cultural institutions corresponds to the peculiarities of population settlement. This can be done with the help of the index of localization of cultural and artistic institutions in amalgamated communities.

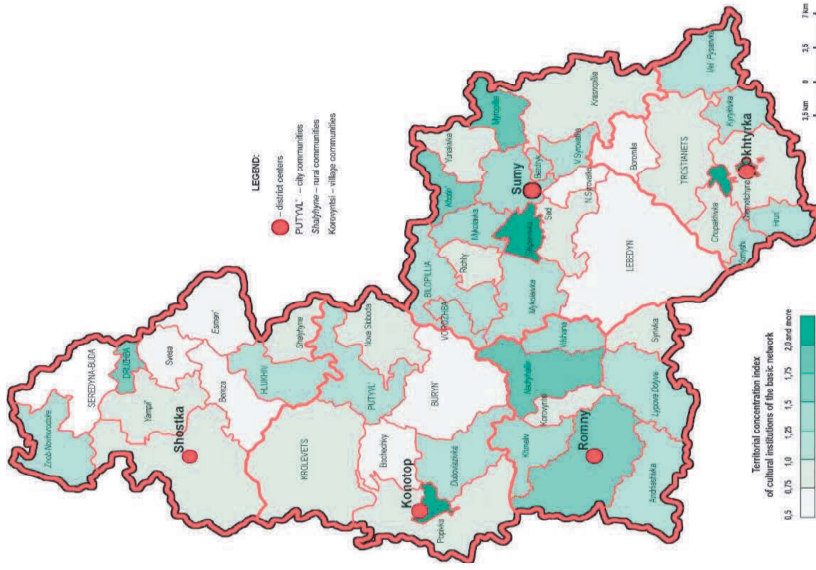


Fig. 4.12. Territorial concentration of institutions of the basic network of culture and art maintained by local communities of Sumy region (as of 01.01.2022)

Having analysed the geographical features of the territorial localization of cultural and artistic institutions (Fig. 4.13) maintained by local communities, we found high and extremely high indicators

in rural and village communities.

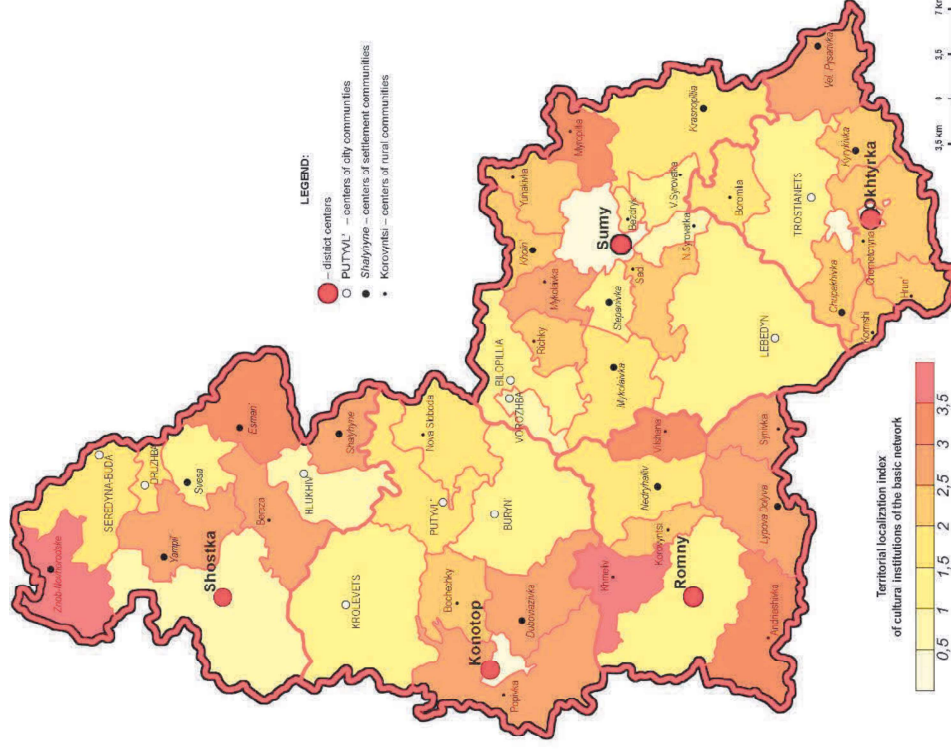


Fig. 4.13. Territorial localization of the institutions of the basic network of culture and art maintained by local communities of Sumy region (as of 01.01.2022)

Thus, in the Myropillia andriyashivka, Vilshana village and Esman' rural communities, the value of I_L exceeds 3.0 and in the

Znob-Novgorodske rural community it reaches 5.23. This will further lead to a forced optimization of the basic network of cultural institutions in the respective communities. It will be much easier to maintain cultural institutions in urban amalgamated communities, where the concentration and localization of cultural service institutions are lower (in Sumy, Konotop, Okhtyrka and Shostka urban communities, the values of I_i are 0.08, 0.15, 0.22 and 0.59, respectively) and there are greater opportunities for their development.

Based on the socio-geographical specifics of cultural services for the population of Sumy region, the existing network of cultural institutions generally provides the inhabitants' needs for cultural services, given the financial capabilities of territorial communities and the functioning of the entire cultural service system in the context of war. However, even outside of martial law, some problems could significantly improve the provision of cultural services. The key ones are as follows:

- outdated material and technical base: musical instruments, stage costumes, scenery, music literature, technical means, library collections, equipment;
- outflow of highly skilled creative professionals due to a decrease in the prestige of the profession;
- depopulation, which makes it unprofitable to maintain municipal cultural and artistic institutions in sparsely populated settlements;
- conservatism in the forms and methods of providing cultural services, insufficient implementation of creative and cultural industries.

At the same time, despite the above problems, the employees of the institutions show decent performance and respond flexibly to modern challenges. An important feature of the network of cultural institutions of territorial communities in Sumy region is the real prospects for its expansion and improvement. These include the following measures:

- opening of cultural institutions, primarily in cities, which can be done through the renovation of premises and buildings in their industrial zones;

- taking public museums and other cultural institutions into communal ownership and implementing creative initiatives;

Increasing various forms of cultural mobility and touring activities; cultural exchange between villages and cities through various art projects.

At the same time, the issue of the ability of territorial communities to maintain an extensive basic network of primary cultural institutions, which are low-profit and subsidised, remains quite relevant. Lack of funding and progressive depopulation will lead to their optimization, especially in those communities that have inherited a large number of cultural institutions in villages that are gradually becoming sparsely populated.

Summing up, we can say that the socio-geographical study of the basic network of local cultural institutions in the territorial communities of Sumy region revealed the following: the formation of a modern network within the framework of the decentralisation reform is generally complete; unique geospatial features of the network of cultural institutions are caused by the configuration of the territory or other community and the peculiarities of the settlement network; the component structure is formed by institutions of six types; the territorial and functional structure of the network is represented by four types of the findings of the study can be used in the creation and implementation of targeted programs for the development of culture and art to improve the territorial accessibility of service provision.

Thus, social infrastructure is the basis for the development of such industries as healthcare, education, culture, transportation, etc. It is an important factor for the economic development of the region, influencing investment attraction, entrepreneurship development and labor productivity, as it creates favourable conditions for the population to live and work. In general, it creates favourable conditions for the comprehensive development of the region and the improvement of its competitiveness at the national level. As noted above, Sumy region has certain problems in the development of social infrastructure. These materials can serve as a basis for developing a social development strategy for the region or as a material for developing programs for the socio-economic

development of territorial communities, districts, or the region as a whole. After all, the level of social infrastructure development is an indicator of the region's well-being, which has a long-term impact on the quality of life, economic development and social stability.

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