Spatially Uneven Development in Russia

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Abstract—The article discusses the main concepts concerning spatial inequality (uneven development, concentration, polarization, fragmentation, shrinking of sociogeographic space) in the Russian and foreign literature as applied to the problems of today’s Russia. Russian geographers pay much attention to both interregional and intraregional inequalities, as well as to their natural, historical, economic, demographic, and institutional factors. On the vast and unevenly developed territory of Russia, with its natural contrasts and different results of post-Soviet transformations, spatial inequality has become one of the fundamental characteristics. On the one hand, inequality facilitates the development of the country by focusing its population and economic activities in certain cores where agglomeration effects are most pronounced. On the other hand, it narrows an inclusive development space, leaving low chances for other areas. Official statistical data sets by region and municipality are applied in the article to analyze the cumulative effects of shrinking socioeconomic space along the North–South, East–West, and center–periphery axes. The inequality of old-developed regions from Central Russia to the Urals is shown in greater detail, taking into account historically inherited and new geographical differences. The results are presented in the form of thematic and complex (typological) maps, drawn at various levels by federal subjects and municipal and urban districts. Centers and growth factors are identified versus peripheralization and lagging of other areas. The research has led the authors to a conclusion about the significant inertia of the Russia’s spatial development and the stability of endogenous factors structuring its space under all changes, including post-Soviet ones.

Keywords: inequality, polarization, shrinkage of developed space, socioeconomic diagnosis, city, rural area, center, periphery

INTRODUCTION

According to World Bank data for 2018, Russia ranked 80th out of 164 countries in personal income inequality, surpassing such closest neighbors as Ukraine, Belarus, Kazakhstan, and many OECD countries.¹ According to Federal State Statistics Service (Rosstat), in the post-Soviet period from 1990 to 2020, the cash income share of the wealthiest 20% layer increased from 32.7 to 46.4%.² Income inequality is one of the aspects of the polarization of society, along with unequal access to social infrastructure, education, jobs, their different quality, etc. These disparities, in turn, are closely related to spatial inequality: stratification of territories and places into more and less successful, growing and stagnating, which is increasingly becoming a brake on the development of the country as a whole.

It is well known that people commonly migrate to places where they see chances for a better life and successful realization. There are few such places on the map of Russia: the largest cities, oil and gas extracting regions, and some southern ones (Borodina, 2017; Nefedova and Glezer, 2020; Zubarevich et al., 2020). Pulling people to these places against overall natural decrease is expanding the ranges of depopulation (Karachurina and Mkrtchyan, 2016; Kashnitsky, 2020).

Growth in spatial inequality is often considered a global phenomenon, associated with waves and stages of technological development (Kemeny and Storper, 2020), urbanization (Urbanization ..., 2008), path dependency (Hedlund, 2005), and economic growth models (Golubchikov et al., 2014; Harvey, 2006). In Europe, it is particular noticeable in postsocialist states, where the development of market relations has been accompanied by the concentration of capital and human resources in the capital regions and rapid peripheralization of the margins (Frost and Podkory-
In Russia, the severity of spatial inequality is enhanced by the following objective factors:

— the vastness of the country with a sparse, especially compared to Europe, network of large cities and zones of their influence and sharp center—periphery gradients (Gritsay et al., 1991; Ioffe et al., 2006; Nefedova, 2013; etc.);

— the harsh natural environment in most of the country, combined with the legacy of the Soviet development model that shifted economy and settlement pattern to the north (Hill and Gaddy, 2003; Klimat ... , 2020; Prostranstvo ..., 2012, pp. 128–154; Treivish, 2009);

— historical and ethno-cultural heterogeneity of development backgrounds (Nefedova, 2013; Streletsy, 2017; Tishkov, 2008);

— rapid urbanization and industrialization of the 20th century with uneven rural depopulation and new forms of the rural—urban interaction (Mezhdudomom ..., 2016; Gorod ..., 2001; Nefedova and Treivish, 2019).

Institutional conditions also play an important role. The concentration of income at the upper (federal and, to a lesser extent, regional) levels of the budget system and degradation of local self-government only strengthen centers at the expense of the periphery (Glezer, 2013; Zubarevich, 2019; etc.).

If spatial diversity is largely a prerequisite for economic development, and unevenness is its companion (Barrios and Strobl, 2009), then deep inequality is a brake that, with each new turn of the historical spiral, aggravates relations between the polar regions. In recent decades, these problems in Russia have been analyzed time and again; attempts have been made to identify the roots and effects of inequality from various perspectives (Kolomak, 2013; Preodolenie ..., 2018; Zubarevich, 2019a; Zubarevich and Safronov, 2019; etc.). Our goal is not only to summarize publications, but also to: (1) assemble a complete picture from fragments showing the range of spatial inequality and its main aspects in present-day Russia; (2) categorize this picture based on material of the selected area.

The article begins by reviewing the main terms characterizing the intensity and effects of spatial inequality. Subsequent sections review its directions, factors, and effects based on literary sources and the authors' own empirical studies. Problems of inequality are typical of any spatial level, from global to local. Therefore, when studying the Russian space in general and inequality in particular, a multiscale approach is particularly important (Kaganski, 2001; Nefedova, 2013; Treivish, 2009). However, in Russian science, research is most widely represented at the level of federal subjects. At the municipal level, more often than not, they are carried out in individual regions (Medvedev and Nefedova, 2021; Nefedova and Starikova, 2020; Sheludkov et al., 2016; etc.). The inequality of municipalities throughout Russia was analyzed in order to identify urban agglomerations (Antonov and Makhrova, 2019) and study the specifics of population migrations (Mezhdudomom ..., 2016, pp. 174–194; Karachurina and Mkrtychyan, 2016; Mkrtychyan, 2019). There have been attempts to describe and classify municipal economies (Romashina, 2020). In a very fractional picture of the whole country, the main causal relationships are not always clear.

We conducted a case study of 37 old-developed regions of European Russia at the municipal level (1190 municipalities). For this, indicators from the Rosstat database were used, retrospectively recalculated within the boundaries of municipalities as of January 1, 2021.

INEQUALITY AND RELATED CONCEPTS

The terms “inequality,” “unevenness,” “polarization” and others close in meaning are common in the scientific literature. They seem to be close notions, but not identical (Nefedova and Treivish, 2020; Staroosvovenny ..., 2021, pp. 17–18).

Inequality has a social and/or political connotation, related to people, their groups, including territorial ones, and usually requiring estimates per capita. It is not a synonym for injustice, since both fair inequality or unfair and inefficient leveling do exist (Okun, 1975; etc.). The question leads into the jungle of humanitarian thought, but has an obvious spatial dimension.

Unevenness refers to development. The latter is always differentiated which can aid or hinder it. This vast topic was touched upon by classical scholars in different contexts, within the context of location and spatial organization theories, starting with J. von Thünen (1826), as well as innovation diffusion (Hägerstrand, 1970; Rogers, 1962; etc.). Global growth or recession affects spatial unevenness diversely, either reinforcing it, when following the initial irregularities of the socioeconomic relief, or smoothing it out (Massey, 1984).

Concentration means the strengthening of a particular phenomenon in any framework, including spatial. The main problem is these frameworks, the shapes and sizes of the cells in which concentration manifests itself and is fixed. However, while other places are growing along with the centers, albeit not so fast, this is just concentration. Its positive consequence is the agglomeration effect, which increases the efficiency of the economy, including through the flow of knowledge between companies and industries, which allows centers to accelerate their development and transfer their achievements to the periphery (Zubarevich, 2012).

Polarization involves cases where growth and development are reduced to one place, while others (the opposite pole) are covered by decline, depopulation...
and economic depression. Often the same phenomenon is called segregation, stratification or divergence of space—terms that came from vector field analysis in mathematics.

*Shrinkage* is the dragging of vital activity to centers. Localized shrinkage is direct, visible, and condemned, when partial loss of inhabited and economically active land is evident. Another form, most likely virtual and positive, is approximation, or convergence of places due to better communication (Szhatie..., 2010). The two forms normally act in favor of centers and harm the periphery thus leading to *fragmentation* of space into “live” and “mortified” areas and their separation, including within each category.

These concepts appear in recent works by Russian authors increasingly interested in spatial polarization (Anokhin and Fedorov, 2017; Kuzin, 2019; Makhrova et al., 2016a; Makhrova et al., 2016b; Uskova, 2015; etc.). The term was included in the titles of at least a dozen candidate dissertations, most often in regional economics, defended in 2010–2020 in different cities of Russia, from St. Petersburg, Belgorod, and Krasnodar to Irkutsk. A review of the methods and trends of these studies (Anokhin and Kuzin, 2021) contains 95 Russian and foreign sources, including large collective publications, and identifies 10 main thematic areas. Spatial unevenness (differentiation) and concentration have also been discussed in many works. Shrinkage was less fortunately, apparently due to its complexity and problems of its analysis.

**INTERREGIONAL INEQUALITY: FACTORS, MANIFESTATIONS AND CONSEQUENCES**

For centuries, the development of the margins, especially the eastern and northern, was one of the main Russia’s guidelines based on the myth of the country’s inexhaustible human and other mobile resources. Although only 15% of the territory in the southwest Russia has favorable living conditions for people and agriculture (Klimat..., 2020), by the 21st century, here, to a greater extent than in other countries with harsh natural environments (e.g., in Canada), the population shifted to cold zones. The complexity of living conditions in Russia is also increasing to the east due to the climatic asymmetry of the mainland and distance from primate centers. The USSR supported the settling of the north and east with administrative and financial measures. In the most severe forms it consisted in mass convict labor and, later, recruitment of specialists for large industrial projects through high salaries, benefits and special supplies. The weakening of these measures in the 1990s increased the contrast between east and west and north and south, leading to emigration from many extreme regions. The main settlement zone in European Russia still reaches the 60th parallel, extending beyond the natural comfort zone.

Since the 1990s, trends in Russia’s spatial development have been affected by the collapse of the USSR, the change of institutions and the type of economy (Sotsio-economicheskaya..., 2016). Polarization of the socioeconomic space, including shrinkage of its industrial layer, has been noted (Szhatie..., 2010; Treivish, 2021; etc.). The signs of these phenomena first took the form of a crisis deindustrialization, exposing the problems of both old regions and centers, where in the 2000s it was replaced in some cases by reindustrialization, but rarely radical, and zones of recent development, from where, with the cessation of support, a massive migration outflow began (Zaiouchkovskaya, 2012).

Uneven development has intensified along three axes: between the north and south of the country, between its western and eastern regions, and between centers and peripheries, i.e., between the main urban agglomerations and the rest of the country, the centers of regions and their outskirts, and often even within municipalities. In other words, unevenness has manifested itself at different scales, affecting not only the industrial, but also the agricultural sector, as well as the tertiary sphere of trade and services and informational quaternary sector, and with them, areas of different size and status.

**Space as a factor of inequality and problems involved in overcoming it.** The heterogeneity of the geographical space is exacerbated by poor communication accessibility of even many old-developed territories. With the large lengths of railways and roads, their average density is much lower than in Europe, the USA, China, and Mexico. Instead air communications could be developed. At one time this was the case, but the collapse of the USSR led to a crisis in the sector (as well as in the civil aircraft industry). Hardest hit were interregional transportation bypassing the main hubs, especially Moscow (whereas connections with it from distant regional centers were retained or grew), and intraregional, usually involving light aircraft (Tarkhov, 2015, 2017). The number of airports faced a sixfold reduction, and the main indicators of their operation returned to the 1980s level only in the second half of the 2010s, but this recovery was interrupted by the 2020 crisis caused by the COVID-19 pandemic, which sharply reduced air mobility of the population, among other things (Tarkhov, 2021).

In Russia, there is only one high-speed Moscow—St. Petersburg railway with a passenger speed of more than 200 km/h on the country’s first mainline, built back in 1851. For a speed over 250 km/h, a new route is needed, so far only designed in the same direction. The implementation of the Moscow—Kazan high-speed railway project remains at the initial stage. Motor roads have been built and reconstructed more actively, but they are many times denser in the South than in the North and East. In addition, the priority of major highways hinders the development of transport
in general, leading to cancellations of trains and disruption of road networks, etc. (Puteshestvie ..., 2015). More than 20% of rural households are connected to the public road network, at best, with poor and dirt roads.\(^3\)

Progress in the information and communication sphere is much more pronounced. Russia became one of the first countries where the number of active SIM cards exceeded the number of citizens (since 2006). It ranks fifth place globally in this indicator and in the number of Internet users (in 2010 it was seventh). However, the level of Internet access is lower than in developed countries. Cellular communications, coupled with internetization, is the mainstream in the sector, like worldwide (Nagirnaya, 2019). This communication is more or less stable in permanently inhabited settlements of almost all regions, but in the zones between them it is often absent: 30% of households lack reliable Internet access. The digital divide between regions is large. According to Rosstat, in 2019, more than 85% of households in the gas-producing Yamal-Nenets Autonomous Okrug, Moscow, and five regions from different parts of the country had broadband access, but no more than 55% in Chukotka and Khakassia. In 2020, amid mobility restrictions due to the COVID-19 pandemic and the shift to remote work, study, etc., the demand for home cellular signal boosters skyrocketed and trips to neighborhood places where such a connection was more reliable became more frequent.

The inequality caused by the problems of transcending space is associated not only with its physical size and means of communication, but also with the ratio of transport fees and average per capita income, when many of the not so remote areas have become inaccessible (Szhatie ..., 2020, p. 26).

**Economic inequality.** N.V. Zubarevich derives the inequality of regions from the different structure of their economy, geography of investments and institutions (Maleva et al., 2019; Zubarevich, 2019a, 2019b). The structural trend since 1990 has been deindustrialization of employment and growth of the tertiary sector. The economy of both capitals and a number of southern and other regions has become purely service-oriented, but even in European Russia, there are fewer service regions than industrial and industrial-service regions. Such shifts have not always been evolutionary; sometimes they only mirrored the crisis of the former leading industries (Treivish, 2021). As for fixed capital investments per capita, on average for 2010–2019, they were significant in the northern and eastern regions with raw materials; capital cities; Tatarstan and some other republics; and in single years where costly construction was carried out before important political and sports events (as in Krasnodar krai for the 2014 Winter Olympics).

Crisis-related downturns in the post-Soviet economy have their own regional dimension, depending on the nature of the crisis, up to that triggered by the COVID-19 pandemic (Kuznetsova, 2020; Zubarevich and Safronov, 2020). However, none of them eliminated fundamental differences, especially along the center–periphery axis.

The crisis in the manufacturing made the country a “mining” one. Therefore, GRP per capita is highest in only three oil and gas producing autonomous okrugs (Nenets, Yamalo-Nenets, and Khanty-Mansi); in Sakhalin, Chukotka, and Magadan oblast with their small population; and in Moscow, where statistically large share of products is conditionally registered at the location of the headquarters of many respective commodity companies (Vyzovy ..., 2020, p. 225). The spatial inequality of the consolidated budgets of federal subjects correlates with GRP (Fig. 1), i.e., the combined budgets of a region and its municipalities (excluding the budget of the state territorial compulsory medical insurance fund).

**Settlement pattern trends.** Shrinkage of the settlement pattern at all spatial levels, with natural population decrease in most regions, except for a number of ethnic autonomies, has been the mainstream in recent decades. Migration flows are the human response to the geographical inequality of living and working conditions. In the beginning, these losses were prominent in areas east of the Urals (in 1989–2002, population decreased by 2.4 mln people there, while in European Russia, it increased by 0.5 mln). In the last 20 years, the decrease has become almost ubiquitous. InEven in the Central Federal District outside Moscow region, population has declined by 5% and rural, by more than 7% during the last ten years. It was held back by cities, primarily centers of regions that collect internal migrants. The number of Muscovites has grew by 8% in these years, and the number of urbanites in Moscow oblast, by 11%. COVID-19 has not changed general trends, only strengthening the demand for second homes in Moscow suburbs.

No more than 15 regions attracted migrants by 2020. These were both capital regions, Krasnodar krai, Crimea, Belgorod oblast, and the most successful Siberian regions (Vyzovy ..., 2020). Not a single region that lost population in the late Soviet decades was able to reverse this trend even after the collapse of the USSR (Borodina, 2017). In addition to the availability of work and better wages, particularly in the tertiary sector, moving to Moscow, St. Petersburg, and their environs is associated with universities: 20 and 7% of Russian students studied there in 2018/2019, respectively (Zotova, 2022).

An increased share (above 40%) of population with a per capita income of over RUB 45 000 per month generally corresponds to the economic potential of

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\(^3\) 2016 All-Russian Agricultural Census. Vol. 2. Preliminary results of the 2016 All-Russian Agricultural Census for federal subjects. Moscow: IIC “Statistics of Russia,” 2017.
regions. Apart from northern regions, this is just Moscow, where both the strong agglomeration effect and capital rent generated by city status and proximity to decision-makers are important (Zubarevich, 2012).

Income inequality is a manifestation of spatial inequality in a broader sense, including the state of budgets and the population’s access to quality education, health care, and decent work (Vyzovy ..., 2020). Researchers of social inequality in Russia increasingly argue that it suppresses economic growth by narrowing domestic demand and hindering structural shifts, and regions manifest it in different ways.

Geographers are paying much attention to the overconcentration of innovations and finances in Moscow and its surroundings, with weak modernization of stagnant and depressed hinterland regions as the reverse of the medal dependent on federal assistance. Up to two-thirds of Russians live there in a vicious circle: the active population left such areas, exacerbating their problems. Meanwhile, Moscow absorbed an annual average of 95 thousand interregional and international migrants in 2012–2017. St. Petersburg has been slightly lagging, with a migration gain of 65000 (Nefedova, 2020). Migrants looking for permanent residency or temporary job—up to 1.2–1.3 mln people per year (Mezhdou domom ..., 2016; Nefedova and Starikova, 2020)—go primarily to cities and districts closest to the capital, thereby increasing the development contrasts in Russia, its central part, and within the Moscow region.

Large cities in Moscow oblast with population 100000 or more attract migrants and investment, etc. Their total population, numbering 3.5 mln, is larger than that of the centers of seven adjacent regions (Table 1). The growth of smaller suburban towns depends on their proximity to Moscow: the closer to it, the more migrants who are gravitated to the capital’s labor market but repelled by housing and rental prices in the capital itself. Moscow oblast has firmly taken first place in the country in housing construction, ahead of Krasnodar krai and Moscow by 1.75—1.8 times (in 2020) and outstripping many hinterland and sparsely populated northern and eastern regions by hundreds of times.

**Fig. 1.** Consolidated budget revenues of federal subjects per capita in 2019, RUB thous. 
*Source:* Sampling from reporting forms for period: January 1, 2020 Budgets of federal subjects in numbers/Budget.ru. January 10, 2020. https://bujet.ru/article/396309.php.

**Table 1.** Excess of Moscow population over totals of large cities’ residents in Moscow oblast (MO), neighboring oblast centers (OC), and St. Petersburg, times

| Category of cities                  | 1979 | 1989 | 2002 | 2010 | 2019 |
|------------------------------------|------|------|------|------|------|
| Moscow/large cities of MO          | 3.4  | 3.3  | 3.9  | 3.7  | 3.5  |
| Moscow/neighboring OC              | 2.8  | 2.7  | 3.4  | 3.5  | 4.0  |
| Moscow/St. Petersburg              | 1.7  | 1.9  | 2.2  | 2.3  | 2.3  |
| Large cities of MO/neighboring OC  | 0.8  | 0.8  | 0.9  | 0.9  | 1.2  |

*Source:* (Nefedova and Starikova, 2020).
Shifts in agriculture are also taken into account, starting with those brought about by market reforms. They have affected regions in different ways, causing in some a deep crisis and business closures, while in others, modernization and emergence of new agribusiness types. The three main drivers of spatial inequality in agriculture—environmental conditions, labor resources, and investment—are interconnected; the latter two depend on the network of large cities (Leibert, 2013; Nefedova, 2013, 2019).

The role of natural differences has intensified. Regions of the forest zone with shallow marginal lands suffered much more than southern ones. With the removal of huge Soviet subsidies and the regional self-sufficiency policy, the total volume of gross agricultural output and key grain crops shifted to areas with better natural conditions (Fig. 2) due to the benefits of concentrating production where it is most profitable.

Reforms in regions proceeded differently (Dan’shin, 2017; Nefedova, 2013). In fertile southern regions, which retained their labor potential, new farms increased their contribution to grain and sunflower output (up to 30–40%). These private farms compete with the former collective farms as producers and as tenants of land shares. In area of land used, they are often comparable to Soviet enterprises. Non-Chernozem regions, which have been losing human capital for many years, hold few farmers. In the republics of southern European Russia and Siberia, the indigenous population returned to traditional animal husbandry.

The late 20th–early 21st centuries global trends in agriculture have been industrialization of the sector, the formation of a single market for its goods, and geographical convergence in terms of market inclusion (Timmer, 1997). This is also typical of Russia. Here, the concentration of production in large structures has prevailed at the expense of smaller ones since the 2000s (Barsukova, 2016; Bogachev, 2017; Smith and Timar, 2010; etc.). Up to 50% of output of all agricultural organizations comes from agroindustrial holdings (Shagaida and Uzun, 2019). There are regions where two to three enterprises out of 100–150 are responsible for 50% of output. However, in contrast to Western countries, where small farms are often integrated in the chains of large companies (Naumov, 2014; Barsukova, 2016), Russian holdings cooperate poorly with small and medium-sized producers. Poultry and pig-breeding giants are deliberately crowding them out and seizing land. Since the time of the USSR, cattle herds have halved in Russia, particularly in the Non-Chernozem Zone, despite the abundance of meadows and pastures, increasing the spatial polarization of the sector (Nefedova, 2019). Belgorod oblast, “the meat capital of Russia,” alone has concentrated almost a fifth of the pig population. Fifteen leading regions (out of 85) produce 55% of meat in the country. The dominance of large retail chains in

![Fig. 2. Region’s share in gross output of Russian Federation, 2019 to 1985, times. Source: Rosstat and Goskomstat data.](image)
Russian cities signals the monopolization of the food market.

The combination of these processes has deeply affected the countryside. Reliance on large highly productive complexes, solving the problem of food supply to cities, has sharply increased spatial contrasts. In the Center and Northwest, the agricultural sector has become selectively focal, with few small commercial farms. This has undermined the economy of many settlements, caused a sharp decline in employment (Averkieva, 2017), and intensified migration outflow from rural areas. It has exacerbated the results of depopulation accumulated over decades and become a brake on economic development, which could have relied on small household farming (Alekseev and Safronov, 2018).

Contrasts in the rural areas’ state, as well as urban, are visible at the interregional level, but are even more noticeable within regions, as experts have long pointed out (Gritsay et al., 1991; Karachurina and Mkrtchyan, 2016; Nefedova, 2013; Nefedova and Starikova, 2020; Staroosvoennye ..., 2021, pp. 46–59; Szhatie ..., 2010; Tkachenko and Fomkina, 2012; etc.).

Municipalities of different regions, being in the same natural conditions, with similar populations and specialization, “have much more in common than different territories within the same region” (Romashina, 2020). Therefore, research at the municipal level is very important for identifying urban and rural development trajectories. In official documents, the transition to this scale began in the late 2010s. It is considered one of the achievements of the Strategy for the Spatial Development of Russia until 2025, adopted in 2019, although many of its provisions have been subjected to criticism (Kuznetsova, 2019; Zubarevich, 2019c), including as those far from solving key problems of spatial inequality. In the 2020 program “Integrated Development of Rural Territories”, the Institute of Agricultural Economics (VNIIESKh) suggested an economic and socioecological typology of rural areas at the municipal level. The desire to replace the level of the federal subject with a municipal level as the key one in analyzing spatial development and inequality is becoming a trend in Russian studies.

In this study, a limited range of 37 old-developed regions was selected. They occupy 16% of the country’s area, including the historical core of the Moscow state with its cities, some of which were founded in the 9th century, and areas to the south, east, and northwest of the core, included into Russia in the 16th–18th centuries. For old-developed areas, development is particularly characterized by a combination of modern factors and inherited spatial structures.

The main approach to identifying inequality and its spatial patterns at the municipal level involved analysis of the main prerequisites and factors of inequality, as well as in diagnosis of the socioeconomic state of municipalities (municipal districts and urban districts) according to a number of characteristics available in official statistics (for more details see (Nefedova and Sheludkov, 2021)).

Basic premises of spatial inequality. The factors or prerequisites for inequality in the socioeconomic development of municipalities can be divided into two large groups: (1) zonal, associated with differences in natural conditions for the life of the population and keeping of the economy; (2) azonal, manifesting itself precisely at the municipal level and reflecting the influence of large cities depending on their size, position within the region, and transport accessibility.

The total extent of the territory under consideration from north to south exceeds 1500 km, which makes zonal climatic and landscape differences significant. Up to a third of the territory under consideration, in the zone of the northern taiga forests of the European part of Russia, can be classified as cold with excessive humidity. More favorable natural conditions for agriculture and human life are typical of the forest–steppe and steppe regions south and west of Moscow: in the south of Bryansk and Ryazan oblasts, in the Central Chernozem Area.

Cities here developed as bases for the colonization of territories. Later, the advantages of administrative status, concentration of industry during the Soviet period, and post–Soviet development of the tertiary sector strengthened the role of large centers. Of the 170 large (more than 100 000 inhabitants) cities of Russia, 91 are located in this old–developed part; 21 are in the Moscow oblast. The populations of 20 cities exceed 0.5 mln inhabitants. As a result, the regions under consideration are most often monocentric formations with one clear leader (rarely two), and almost everywhere it is the regional capital.

We determined areas within a radius of 60 km from the center of each region as its near and far suburban/peri-urban rings, at a distance of 60–120 km as the semiperiphery, and over 120 km as the regional periphery. The main feature of the peri-urban ring is a vibrant economic environment, closely associated

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4 On Affirmation of Spatial Development Strategy of the Russian Federation for the Period up to 2025. Decree of the Russian Federation Government of February 13, 2019, no. 207-r. https://docs.cntd.ru/document/552375463.

5 Approved by Decree of the Russian Federation Government as of May 31, 2019, no. 696.

6 Development of guidelines for determining the typology of rural areas of the Russian Federation, Report on Research. FNTs VNIIESKh, 2020.
with the city: the larger it is, the wider and denser the ring. However, the effect of the “agglomeration shadow” (Burger et al., 2015) cannot be ruled out, when larger centers intercept service functions from the neighboring cities and towns, weakening their economic potential. With the eccentric position of regional capitals shifted towards each other or towards Moscow, there are sharp deviations from regularity according to the classical scheme of central places (Shuper and Em, 2012). For example, between Yaroslavl, Kostroma, Ivanovo, and Vladimir oblasts, as in some Middle Urals areas, the proximity of large cities creates a wider active peri-urban zone, but the peripheral, so-called bear corners, has also expanded. Much also depends on the today’s economic relevance of a city and accumulated problems (Goryachko, 2021; Nefedova and Treivish, 2021), but the size and distance from the largest centers always affect the trajectory of a city’s development (Makhrova, 2021; Nefedova and Sheludkov, 2021), but the size and distance from the largest centers always affect the trajectory of a city’s development (Makhrova, 2021; Nefedova and Sheludkov, 2021), but the size and distance from the largest centers always affect the trajectory of a city’s development (Makhrova, 2021; Nefedova and Sheludkov, 2021). In rural areas, this is even more noticeable (Nefedova, 2013, 2019). Russia, according to A.I. Treivish (2009, p. 348), on the whole is an archipelago of a few key centers in the ocean of the periphery, which is distinguished not only by remoteness, but often by depopulation and economic degradation, although the role of both the natural conditions of the area and ethnic composition of its population is important (Nefedova, 2013, pp. 180—188).

Remoteness from the regional center is sometimes mitigated by the presence in the region of a second city with about 100 000 residents or more. For other cities, their socioeconomic condition is important, and the smaller the city, the higher the likelihood of its depression (often due to a crisis or the absence of a city-forming enterprise) (Gunko and Glezer, 2015; Nefedova and Treivish, 2010). The position of municipal districts and districts adjacent to Moscow oblast is more advantageous, particularly if they are located on transport routes.

If we combine three factors—distance to the regional capital, size of the local center, and proximity to Moscow—then we can divide districts into five classes in accordance with the best (1) and worst (5) center—periphery prerequisites for development. To identify the types of municipal districts according to the prerequisites for development, the center—periphery conditions were compared in a checkerboard legend with climatic conditions (the sum of active temperatures) (Nefedova and Sheludkov, 2021). As a result, a very contrasting, but expressive and quite explainable pattern was obtained (Fig. 3). In the south, climatic conditions partially offset the negative effects of a peripheral position, while in the north, they increase them. As a result, areas remote from
large cities and located in unfavorable climatic conditions account for more than 80% of the area of the considered old-developed areas, and the number of their inhabitants is 20 mln people (Table 2).

### Table 2. Share in the territory and population of old-developed areas with different center–periphery and natural prerequisites for development

| Territory          | Group of districts | 1 (best) | 2 | 3 | 4 | 5 (worst) |
|--------------------|--------------------|---------|---|---|---|-----------|
| Entire macroregion | Share in territory, % | 2.8     | 4.6 | 10.8 | 18.3 | 63.5 |
| Center             | 5.1                | 7       | 17.2 | 21.9 | 48.8 |
| Urals              | 2.1                | 1.2     | 5.5  | 15.7 | 75.5 |
|                    | Number (share) of population, mln people (%) | 20.7 (32.3) | 12.4 (19.4) | 9.6 (15.1) | 9.8 (15.4) | 11.3 (17.6) |
| Center             | 6.1 (35.2)         | 4.4 (25.2) | 3.2 (18.4) | 1.8 (10.1) | 1.9 (10.7) |
| Urals              | 3.9 (39.1)         | 0.6 (5.9)  | 1.3 (12.5) | 1.6 (16.2) | 2.6 (26.2) |

*Source: (Nefedova and Sheludkov, 2021).*

Socioeconomic diagnostics. The long-term influence of two groups of factors—center–periphery position and climate—affected the population of rural areas with particular distinction. The vast majority of districts north of Moscow remote from regional centers have a population density of less than 5 people/km² (Fig. 4). Intraregional gaps in population density are also significant, being five- to tenfold or

![Fig. 4. Population density outside administrative center, people/km², 2021.](https://example.com/f4.png)

*Calculated from: (Settlements of Russia: Population and Geographical Coordinates. Source: Ministry of Health of the Russian Federation; processed: Research Data Infrastructure, ANO “TsPUR”, 2021. http://data-in.ru/data-catalog/datasets/160/. Accessed: August 20, 2021).*
greater. The densely populated area shrunk to separate pockets associated with cities, and to transport rays leading towards Moscow. This pattern is violated by the national republics of the Middle Volga Region, where urbanization commenced later and local communities has not yet been destroyed to such an extent as in depopulated areas in the West (Nefedova, 2013, p. 186) and in the industrial Urals.

Whereas population density best reflects the accumulated effects of past development, the current migration dynamics represent modern contrasts in the development of cities and regions. As has been repeatedly noted in the literature, Russian regions are characterized by a continuing centripetal migration trend (Mkrtchyan, 2019), and old-developed areas are no exception (Fig. 5). The most attractive to migrants are regional centers and their suburbs (Nefedova, 2020; Nefedova and Treivish, 2020, Nefedova and Sheludkov, 2021): they attract young people seeking education and people of working age; the surroundings of large centers also attract older people owing to suburbanization (Karachurina and Mkrtchyan, 2021; Kashnitsky, 2020).

Long-term migration changes the sex and age structure of the population: in outflow areas, the proportion of older generations increases, and in inflow areas, younger generations, which is reflected in modern indicators of natural increase (Fig. 6). Here, we again see the differences between the conditional West, which exhausted the demographic potential of rural areas in the course of protracted large-scale urbanization in the 20th–21st centuries, and the conditional East, where the consequences of rural depopulation are not yet as noticeable. In addition, within each region, according to the migration balance, territories near the largest cities are stand out: in central regions they alone lose fewer people (except for Moscow), while in the East (from Kazan to Tyumen) they grow.

The combined effect of natural population decrease and outflow from the periphery leads to even greater depopulation in rural areas and small towns. The situation is particularly hard in Central and Northwest Russia, especially in the peripheral rural areas between Moscow and St. Petersburg; in Ivanovo, Kostroma, and Kirov oblasts; as well as in Tambov oblast and Mordovia, where the population loss annually exceeds 18 people per 1000 inhabitants.

The centripetal nature of migration is a direct reflection of the socioeconomic contrasts between large cities and rural areas, as well as interregional gaps in incomes. In 2017, the median salary of employees of enterprises and organizations in the studied municipalities did not exceed RUB 25000/month (Fig. 7); the minimum was close to RUB 16000 in Oleninsky district of Tver oblast, and the maximum was noted in

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Fig. 5. Migration growth rate (annual average for 2015–2017), person/1000 people. 
Calculated from: (Nefedova T.G. et al., Database “Old-Developed Regions of European Russia,” IG RAS, 2021, registration certificate number: RU 2021621439).
Fig. 6. Natural growth rate (average annual 2015–2017), person/1000 people.
Calculated: see Fig. 5.

Fig. 7. Average monthly salary of employees of organizations, 2017, RUB thous.
Calculated: see Fig. 5.
Lobnya and Khimki near Moscow (RUB 105000 and 72000, respectively). Together with active housing construction in the Moscow urban agglomeration, particularly in the 10-km zone around the Moscow Ring Road (MKAD) and along the main transport routes, this leads to an increase in polarization even in Moscow oblast (Kurichev and Kuricheva, 2020; Makhrova, 2021), not to mention contrasts with districts and cities in neighboring regions (Nefedova and Sheludkov, 2021).

Differences in the infrastructural arrangement of territories are added to vast income gaps. The road density, even in the center of Russia, varies regionally by a number of times. Beyond a 5 km band along a paved road, it is difficult to travel on foot or on a dirt road. Outside Moscow oblast and urban agglomerations of regional centers, inaccessibility significantly hinders the development. The level of gasification increases in municipalities of the Central Chernozem regions, particularly Belgorod oblast, as well as in Tatarstan, Bashkortostan, and Chuvashia. The authorities of other regions have failed to achieve such results even in cases when pipelines supplying Europe with Russian gas run through their territory. Even on the periphery of Moscow oblast, the level of gasification is reduced, not to mention in the regions to the north of it, where gas is not supplied to 75% of population centers. Moreover, connecting pipes to them does not mean that gas is available to everyone because of the high cost of connecting houses to the network (“last mile”) and poverty of the population.

**CONCLUSIONS**

Analysis of the spatial unevenness of Russia’s development shows that the endogenous factors in its spatial organization are very stable and, even after significant post-Soviet changes, continue to play a more important role than political, economic, and institutional shifts.

Depending on the scale, there are at least four main types of geographical differences that affect the spatial unevenness of development:

1. **Natural zonal**
   - Most noticeable on a national/macro-regional scale but also locally—in the form of anomalies, such as Vladimir Opolye (fertile open space among forests), with increasing impact on agriculture (Nefedova and Medvedev, 2020), and indirectly, through infrastructure development, on the settlement pattern and living conditions.

2. **Macroregional**
   - Between the old-developed areas of the Center, the Northwest or the younger Chernozem regions, Volga Region, Urals, and Siberia with the Far East, related to their diverse historical experiences.

3. **Interregional**
   - Due to economic specialization and composition of the population, ethnic and rural—urban included.

4. **Intraregional**
   - Manifested at a lower scale and associated with the impact of different-sized cities on the surrounding territories.

A case study of old-developed regions of the country showed that, based on a combination of these features, the territory is broken up into extremely uneven areas. One pole hosts large centers and their outskirts, which attract young active people. In addition to Moscow and St. Petersburg, these are Voronezh, Yaroslavl, Kazan, Tyumen, and Yekaterinburg, as well as more densely populated rural areas of the Chernozem and Volga regions, which have less depleted populations and preserve a diverse agriculture. At the other pole are Non-Chernozem regions remote from large cities, which lose young and working-age people and find it difficult to escape the rut of social and economic depression.

The heterogeneity of Russia’s socioeconomic development in recent years has been increasing due to the shortage of human and financial resources. The main factors at the intraregional level are the size of a city and its status, on which the economic development of the city itself and their surroundings depends. Only in the southern regions has the internal potential for the development of rural areas been preserved, but even there geographical location, economic profile, regional specifics, and the policies of regional and city authorities play an increasingly important role. Together, this determines the ability of municipalities to attract capital and population.

The fact that the population, in addition to some ethnic territories, is growing most actively in the Moscow urban agglomeration and in regional capitals indicates that the country has returned to the active urbanization stage. Large centers continue to “pump out” human capital from villages and hamlets, small and medium-size towns, most of which are in deep crisis, ceasing to be real centers of development.

Despite strong socioeconomic and spatial polarization and delayed deurbanization, a specific leveling is also observed in Russia, particularly in old-developed areas of the Center with the greatest spatial inequality. The pan-European trend of city dwellers heading for the countryside is manifesting itself in a form slightly different form the Western (Mezhdu domom ..., 2016; Second ..., 2013). It is associated with temporary dacha, tourist, and international mobilities. Dacha tradition generate not only the garden and dacha settlements around cities where townspeople reside, but also their demand for summer houses in remote and depopulated villages. This seasonal inflow of citizens into the countryside hinders the process of social desertification of the hinterland in old-developed areas. However, without elementary infrastructural development (the likelihood of which is decreasing under municipal reform that eliminates the grassroots level of local self-government), vast old-
developed territories can only be turned into biosphere reserves.

Spatial development is very inertial. It is associated with the availability of certain natural and human resources, certain infrastructure, and with pronounced differences between northern and southern, western and eastern regions, suburbs of large cities, and the intraregional periphery. The choice of instruments to spur development and smooth spatial inequalities is limited in this regard. It is impossible to find an individual trajectory for each region, let alone inequalities is limited in this regard. It is impossible to find an individual trajectory for each region, let alone

Why a vast room is so necessary for local initiatives and a municipality, from Moscow-based offices. That is why a vast room is so necessary for local initiatives and expansion of regional and municipal financial base.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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