# MEGAPOLIS AS AN ENVIRONMENT FOR REPRODUCTION AND DEVELOPMENT OF HUMAN CAPITAL

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**Abstract**

Living conditions in modern megapolises have a contradictory effect on the processes of reproduction and development of human capital. The purpose of our study was to provide a differentiated analysis of the megapolis environment based on the identification of zones possessing "favorable" and "unfavorable" conditions for the reproduction and development of human capital. The study was conducted in Yekaterinburg – one of the largest industrialized Russian megapolises. We collected data in a representative survey of the residents (n = 3570).

The results of the study showed that residents rated the ecological and vital environment, as well as the environment for development and recreation, the lowest. The analysis revealed a high differentiation of residents' assessments of urban environmental conditions in different microdistricts. The primacy of the Center and a significant share of "outsider" microdistricts testify to the reproduction of a problematic urban development model with a deficit of multifunctional zones. The study results can serve as an information basis for rendering management decisions in order to reverse negative urban development trends, which do not contribute to the reproduction and development of the human capital of the megapolis population.

**Key words:** megapolis, reproduction and development of human capital, survey, urban environment, microdistricts

**JEL Code:** O15, O18

## Introduction

The rapid growth in the number of large and extra-large cities leads to increased concentration of the world's population in them (Scherbakova, 2018). According to UN experts, almost a quarter of the world's population currently lives in million-plus cities (23%). This share will increase to 29% by 2035 (United Nations, 2018). Megapolises, as very large cities in terms of

area and population, become drivers for the development of regions and countries due to the concentration of all kinds of resources – financial, technological, service, informational (Nijkamp, & Kourtit, 2013). At the same time, living conditions in modern megapolises have a contradictory effect on the processes of reproduction and development of human capital. On the one hand, megapolises tend to have more developed areas in which the population's human capital forms, such as education, healthcare, physical education. On the other hand, the population of megapolises faces a lot of stressful situations on a daily basis, which negatively affects their psychological and physical health. Overloaded infrastructure and life support systems, environmental and transport problems, social inequality in the accessibility of urban goods (Osipova, Vershinina, & Martynenko, 2019) have obvious negative consequences for the reproduction and development of human capital.

This fact largely determines the current direction of urban researches, which are primarily focused on the analysis of favorable conditions of the urban environment aimed at the fulfillment of the residents' needs, potential, quality of life and well-being (Ballas, 2013; Vysokovsky, 2014; Kabisch et al., 2018; Leskova, 2018; Musa, Yacob, & Abdullah, 2019 and others).

Representatives of various scientific fields - urbanists, ecologists, sociologists, culturologists, etc. - study the urban environment and its impact on humans. Due to this, the concept of "urban environment" has many interpretations and aspects of consideration. For example, urbanists view the urban environment in terms of spatial forms and planning decisions. The ecologists' analysis is focused on studying the climatic and natural conditions of the city, the quality of air, water, etc. Researchers in the field of humanities are more focused on the analysis of the educational, social, cultural components of the urban environment. Despite the diversity of approaches to the study of the urban environment, the fundamental features of its definition can be identified. The urban environment consists of a combination of natural and man-made conditions that have a direct or indirect effect on human life within a certain territory (Glazychev, 2008). Thus, the urban environment, in the totality of its elements, is an environment designed for the fulfillment of the most important needs of a resident: physical development, maintaining health, housing, security, education, work, communication, cultural development, leisure, etc.

Studies focused on the analysis of the urban environment as an environment for the reproduction and development of human capital are particularly valuable in the context of intense competition of large cities for attracting and retaining human resources. In the current

situation, competitive advantages of cities and possibilities of their innovative growth not only depend on the availability of financial, administrative, political and other capital, but also are largely determined by the accumulated and realized human capital (Mingaleva, Karpovich, & Kozlova, 2017; Thisse, 2018). In the future, human capital will determine the possibilities of economic and social development of any territory - state, region, city (Anikin, 2017).

In strategies and programs for the development of Russian cities, the priority attention is paid to the human factor. This leads to the increasing demand from municipal authorities to conduct assessment studies of the quality of the urban environment and its compliance with the principles of the formation, preservation and development of human capital of the territory. The tradition of using statistics prevails in most such studies. Official reports of municipal authorities mainly demonstrate the achieved indicators of life expectancy, birth rate, construction of new housing, educational and medical institutions, etc. Recognizing the extreme importance of objective statistical indicators, we note that it is equally important to study how people evaluate the various parameters of the urban environment and the possibility of realizing their needs in this environment.

Developing the design of our study, we proceeded from the fact that a megapolis has a greater scope and more complex organization of territorial space in comparison with a large, medium and small city. Structure of a megapolis consists of zones, districts, microdistricts with different functional content, and they can significantly differ from each other in terms of infrastructural capabilities and the nature of the living environment. Therefore, we consider it extremely important to use a differentiated approach in the analysis of a megalopolis as an environment for the reproduction and development of human capital.

# 1 Data and methods

Our study was conducted in one of the largest industrial megapolises of Russia with a population of over 1.5 million people. The purpose of our study was to conduct a differentiated analysis of the urban environment based on the allocation of zones (microdistricts) with "favorable" and "unfavorable" conditions for the reproduction and development of human capital.

Our study was based on 2 principles: the principle of structural separation of elements of the urban environment and the principle of functional consideration of micro-territories. In accordance with the first principle, we identified 3 key elements in the urban environment: ecological and vital environment; infrastructure for everyday and routine needs; environment

for development and recreation. In accordance with the second principle, we examined each microdistrict of the megapolis in terms of 3 functions: as a place of residence, place of employment and place of leisure.

Empirical data were collected using a representative survey of residents. In 2017, we interviewed 3570 respondents from 66 city districts. Questionnaire questions were compiled based on the following indicators:

*1. Assessment of the quality of the urban environment*

Respondents assessed this quality in three groups of elements of the urban environment:

1) Ecological and vital environment (ecological situation, parks and recreation areas, safety of living, medical facilities);

2) Infrastructure for everyday and routine needs (transport accessibility, housing and communal services, domestic services, markets and shopping centers, cafes and restaurants);

3) Environment for development and recreation (sports sections, entertainment industry, children's cultural and leisure facilities).

Respondents rated individual indicators of the quality of the urban environment on a 5-point scale. Based on these assessments, we calculated a group assessment of the quality of the urban environment.

*2. Assessment of microdistricts based on functional purpose*

Residents assessed their microdistricts as places of residence, the microdistricts where they work - as places of employment, and the microdistricts where they prefer to relax - as places of leisure. Based on these assessments, we created three ratings of urban micro-territories –lists of microdistricts as places of residence, places of employment and places of leisure for residents.

For analysis, we used descriptive statistics (mean, median, standard deviation, coefficient of variation) and correlation analysis (Spearman coefficient). Indices were used to create microdistrict ratings (Bagirova, Notman, & Veress, 2017).

## 2 Results

1. Respondents rated the infrastructure for everyday and routine needs the highest among the key elements of the quality of the urban environment. The environment for development and recreation, as well as the ecological and vital environment, were rated lower (Figure 1).

**Fig. 1: Average assessments of the quality of urban environment by key elements**
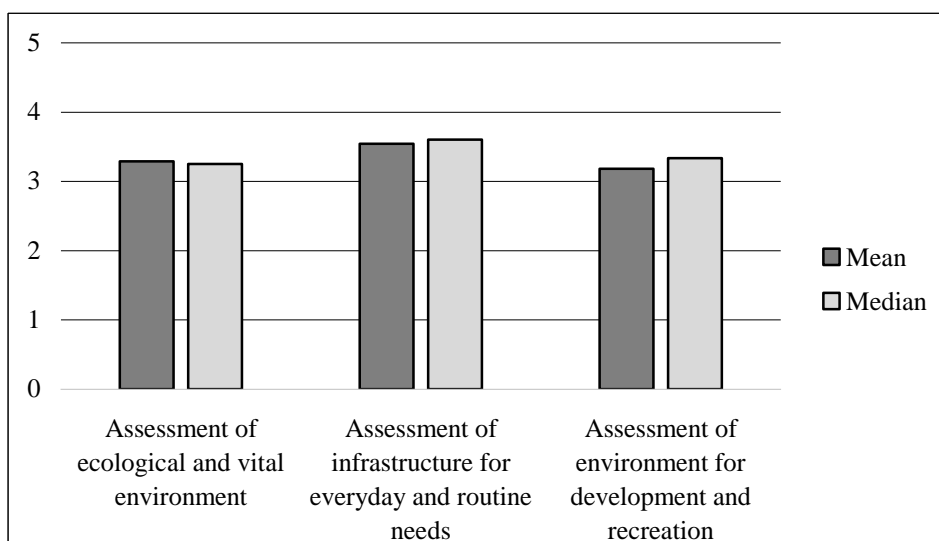


Source: data of the survey

In groups of the urban environment indicators, the lowest assessments were given to:

1) In the group of indicators of the ecological and vital environment – to medical institutions (average value – 3.02), environmental situation (3.16);

2) In the group of indicators of the infrastructure for everyday and routine needs – to catering organizations (3.25), housing and communal services (3.43);

3) In the group of indicators of the environment for development and recreation – entertainment industry (2.90).

2. The respondents' assessments of key elements of urban infrastructure are markedly different. The group of urban environment elements related to opportunities for development and recreation was assessed by the respondents most ambiguously (Table 1).

**Tab. 1: Intra-group variation of assessments of the quality of urban environment**

| Key elements of urban environment | Coefficient of variation of assessments in the group of indicators, % |
|---|---|
| Environment for development and recreation | 33.3 |
| Ecological and vital environment | 25.2 |
| Infrastructure for everyday and routine needs | 24.6 |

Source: data of the survey

3. We revealed high differentiation of the urban environment assessments by city microdistricts. (Table 2).

**Tab. 2: Differentiation of assessments of key elements of the urban environment by microdistricts**

| Groups of microdistricts assessed… | The number of microdistricts assessed in terms of… | | |
|---|---|---|---|
| | environment for development and recreation | ecological and vital environment | infrastructure for everyday and routine needs |
| above the megapolis' average | 22 | 36 | 23 |
| below the megapolis' average | 44 | 30 | 43 |
| Total | 66 | 66 | 66 |

Source: data of the survey

In 20 urban microdistricts, assessments of all key elements of the urban environment were lower than the city average. Consequently, almost a third of the megalopolis' microdistricts can be considered "outsiders" of urban space: their residents assessed the quality of the urban environment in all its components lower than the city average.

4. The number of microdistricts that were assessed lower than the city average differed depending on what function of the microdistrict was assessed. The largest number of urban space "outsiders" was recorded when assessing microdistricts as places of leisure. Considering microdistricts as places of residence, the residents assessed almost half of urban areas below the city average. A slightly smaller number of "outsider" microdistricts was recorded when assessing them as places of work (Table 3).

**Tab. 3: Groups of urban microdistricts based on functional purpose**

| Groups of microdistricts assessed… | The number of microdistricts assessed as… | | |
|---|---|---|---|
| | Places of residence | Places of employment | Places of leisure |
| above the megapolis' average | 34 | 38 | 14 |
| below the megapolis' average | 32 | 28 | 52 |
| Total | 66 | 66 | 66 |

Source: data of the survey

5. Ratings of microdistricts as places of residence, places of employment and places of leisure positively correlate with each other (Table 4). Therefore, the higher the place of the microdistrict in one rating, the higher it is in the other two.

**Tab. 4: Correlation matrix of microdistrict ratings based on functional purpose (N=66)**

| Variables | Rating of a microdistrict as a place of residence | Rating of a microdistrict as a place of employment | Rating of a microdistrict as a place of leisure |
|---|---|---|---|
| Rating of a microdistrict as a place of residence | – | | |
| Rating of a microdistrict as a place of employment | 0.508** | – | |
| Rating of a microdistrict as a place of leisure | 0.475** | 0.562** | – |

**$p< .01$

At the same time, the data in Table 4 show that the maximum value of the correlation coefficient does not exceed 0.56 – this indicates serious differences in the positions of individual microdistrics in the three ratings. These differences are presented in Table 5. The Central microdistrict is the only one that retained the same position in all three ratings – it occupies the first place in all ratings

**Tab. 5: Groups of microdistricts by variation of positions in ratings based on functional purpose**

| Groups of microdistricts | The number of microdistricts | The variation coefficient value, % | |
|---|---|---|---|
| | | min | max |
| Microdistricts with a low variation in rating positions | 41 | 0 | 31.6 |
| Microdistricts with a high variation in rating positions | 25 | 34.0 | 84.7 |
| Total | 66 | 0 | 84.7 |

Source: data of the survey

## 2 Discussions

Our results showed a high differentiation of the residents' assessments of the urban environment in various microdistricts of the megapolis. The superiority of the Central

microdistrict and a significant share of "outsider" microdistricts testify to the reproduction of a problematic model for urban development: central territories significantly exceed peripheral ones in terms of saturation with infrastructure benefits and opportunities. This means that the future may see the formation of discriminatory zones of urban life and the emergence of stable socially depressed territories, in which the reproduction of human capital will be difficult. Our results show that the analyzed megalopolis does not correspond to the polycentricity model, which, in turn, does not allow equal access to various objects of the urban environment for all residents. In addition, 25 urban microdistricts, whose positions in the three ratings differ markedly, are most likely monofunctional. This does not contribute to the formation of a high-quality urban environment and the fulfillment of the entire spectrum of needs of residents. Therefore, it cannot be said that the studied Russian megapolis has multifunctional urban territories that provide the whole range of conditions necessary for the reproduction and development of human capital.

## Conclusion

The main results of our research are summarized as follows: 1) the group of elements of the urban environment associated with opportunities for development and recreation is estimated by respondents – residents of the Russian megapolis – low and most ambiguous; 2) urban space is markedly differentiated – a high differentiation of urban environment estimates by microdistricts is revealed; 3) there are microdistricts that have high ratings as places of residence, places of employment and places of leisure, and at the same time – microdistricts whose ratings are low for all three functional purposes. The results of the study of public perception of urban microdistricts can serve as an information basis for making managerial decisions to improve certain elements of urban environment and to prevent negative trends in urban development (polarization of urban areas, inequality in access to urban goods). Since people are the main capital of the territory, taking into account their opinions (assessments) is a necessary element of work on the priority areas of urban space development

## Acknowledgment

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