Socio-economic aspects of municipal development with consideration to the urban environment quality index

Elena Dvoryadkina, Anna Ermakova and Natalia Istomina

1 Introduction

The Yamalo-Nenets Autonomous Okrug (YNAO) is rightly called the oil and gas capital of the Russian Federation. The autonomous region is a donor region, since the entire budget surplus is redirected to economically dependent regions [1, 2]. As part of this analysis, an analysis of the current situation in the field of comfort within the present state of the cities in the YNAO and the prospects for their development were carried out.

The relevance of this topic lies in the fact that nowadays any city [3, 4] is interested in creating a comfortable urban environment which can ensure the formation of comfortable life activities and an increase in the well-being of the population.

The purpose of the work is to analyze the current state of the urban environment comfort index and formulate a set of proposals to increase this index for the territories of the cities in the YNAO.

The practical significance of this work lies in identifying current problems in the urban environment of the cities in the YNAO and forming a set of proposals to increase the comfort index of the urban environment in these cities.

2 Materials and methods

Since 2019, throughout the country and in the Yamalo-Nenets Autonomous Okrug, together with state authorities and local governments, the “Center for the Implementation of National Projects” has been responsible for increasing the indicators of the Urban Environment Quality Index (UEQI). Thus, to more accurately determine the UEQI, 36*

Corresponding author: dvoryadkina@usue.ru
indicators were identified in 2019, which contributed to a more objective compilation of the rating.

Table 1 displays the ranking of the cities in the YNAO according to the UEQI for 2022.

<table>
<thead>
<tr>
<th>City</th>
<th>UEQI (score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nadym</td>
<td>245</td>
</tr>
<tr>
<td>Salekhard</td>
<td>232</td>
</tr>
<tr>
<td>Gubkinsky</td>
<td>224</td>
</tr>
<tr>
<td>Tarko-Sale</td>
<td>221</td>
</tr>
<tr>
<td>Noyabrsk</td>
<td>206</td>
</tr>
<tr>
<td>New Urengoy</td>
<td>197</td>
</tr>
<tr>
<td>Muravlenko</td>
<td>180</td>
</tr>
<tr>
<td>Labytnangi</td>
<td>180</td>
</tr>
</tbody>
</table>

In accordance with the data presented in Table 1, it can be seen that the average UEQI in the YNAO is 210. Thus, 6 out of 8 cities in the YNAO have a favorable environment.

Table 2 presents the UEQI in the city of Muravlenko for the period 2020-2022.

<table>
<thead>
<tr>
<th>Year</th>
<th>Muravlenko</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>178</td>
</tr>
<tr>
<td>2021</td>
<td>180</td>
</tr>
<tr>
<td>2022</td>
<td>180</td>
</tr>
</tbody>
</table>

Among the cities of the YNAO that participated in the study, Muravlenko had the lowest score according to the UEQI. It indicates that this city has an unfavorable urban environment. The city also belongs to such a size group as small cities with population of 25-50 thousand people.

Fig. 1. Specifications for the UEQI of Muravlenko, 2020-2022
Regressive indicators for 2022 are public and business infrastructure, green spaces, housing and surrounding areas. As part of the ongoing research, it is necessary to develop a set of proposals aimed at increasing the UEQI of Muravlenko.

3 Results

Residential buildings in any settlement must comply with the norms and requirements [5, 6] prescribed in the legislation of the Russian Federation, but, despite a clearly regulated system, dilapidated and unsafe buildings are found throughout the country. In the city of Muravlenko, there are about 112 residential buildings classified as emergency housing, which has a detrimental effect on the “Housing and surrounding areas” indicator.

For the study, two houses were selected, located in the city of Muravlenko on Gubkin Street, houses 44 and 49, built in 1986, consisting of 2 floors and having the status of emergency housing (Figure 2).

Fig. 2. Location of emergency houses on the city map

In 2017, the federal project “Ensuring a sustainable reduction of housing stock unfit for habitation” was founded on the territory of the Russian Federation. In accordance
Fig. 3. Project of a low-rise apartment building

Since during the construction of new houses people will be deprived of housing, they are offered two options:

First option. A compensation in the form of payment of the redemption value (market value + the value of the share in the ownership of the apartment + the value of the share in the common property) for this housing, which they can use to purchase housing themselves.

Second option. A payment of a certain amount for which people can rent an apartment during the construction of new housing.

These payments are made at the expense of the municipality, with a budget allocated in advance for these needs.

The next analyzed criterion is “Green spaces”, which includes all green spaces of the city, regardless of the method of their formation – artificial or natural.

Green areas are parks, public gardens, green pedestrian routes and alleys, which are pedestrian zones and through which the city communicates with streets and squares, residential buildings, and city-wide parks.

In Muravlenko, all landscaped areas are concentrated in the northwestern part of the city.
To form a green frame of the city, the formation of which will contribute to a sharp increase in the index, it is necessary to introduce an additional park. At the moment, in accordance with the city master plan, there is a functional forest zone along Entuziastov Street. The design solutions for the public garden [7, 8] provide for the creation of a full-fledged recreational area and a safe, comfortable pedestrian zone that provides rest for people working in the area.

Figure 5 shows an approximate plan of the planned recreational area. Due to such a factor as the location of the city of Muravlenko in the harshest natural zones of the northern taiga, for landscaping the territory it is necessary to select trees and shrubs that are resistant to this climate.

The next space considered in the framework of this study is “Public and business infrastructure”, which includes territories that are directly adjacent to administrative, business, and retail facilities. The category includes places of trade and offices,
administrative institutions, train stations, airports, public catering establishments, as well as service facilities. There is not a single shopping and entertainment center located in the eastern part of the city, in the industrial zones.

Table 3 presents the indicators of the planned shopping center project

<table>
<thead>
<tr>
<th>Object scale</th>
<th>Purpose of the object</th>
<th>Facility location</th>
<th>Foundation</th>
<th>External walls</th>
<th>State of the object</th>
<th>Engineering communications</th>
<th>Total building area</th>
<th>Number of floors</th>
<th>The height of the above-ground premises</th>
</tr>
</thead>
<tbody>
<tr>
<td>District</td>
<td>Shopping center for visitors in Muravlenko</td>
<td>Yamalo-Nenets Autonomous Okrug, Muravlenko, industrial zone, panel 8</td>
<td>Strip: reinforced concrete</td>
<td>Precast concrete blocks</td>
<td>Design</td>
<td>Built-in transformer substation, automatic ventilation system, air conditioning, fire sprinkler</td>
<td>5000 m²</td>
<td>2 floors</td>
<td>4 meters</td>
</tr>
</tbody>
</table>

Within Tyumenskaya Street there is a plot of land, which, in accordance with the rules of land use and development, is assigned as a public and business zone (Figure 6).

Fig. 6. Fragment of the urban zoning map of the Muravlenko municipal district

4 Discussion

In accordance with the Decree of the President of the Russian Federation No. 68 dated 02.04.2021 “On assessing the effectiveness of the activities for senior officials of the constituent entities of the Russian Federation and the activities for executive authorities of the constituent entities of the Russian Federation”, a list of indicators (indexes) was compiled for this assessment.

SYMBOLS

TERRITORIAL AREAS

RESIDENTIAL AREAS

- Development zone for individual residential buildings
- Development zone for low-rise residential buildings
- Development subzone for low-rise residential buildings
- Development zone for mid-rise residential buildings
- Gardening zone

PUBLIC AND BUSINESS AREAS

- Business, public and commercial zone
- Boundaries of the study zone
This index was developed by the Ministry of Construction and Housing and Communal Services of the Russian Federation and is currently the main tool for assessing the level of living comfort in Russian cities. It allows us to identify weaknesses in the existing municipal management system and formulate methods for improving the current situation. The index formation methodology was approved in 2019.

5 Conclusion

Despite the high level of socioeconomic development [9, 10] of the Yamal-Nenets Autonomous Okrug, the infrastructure of some cities is in a deplorable state. In particular, the city of Muravlenko has a very low level of UEQI; to improve it, it is necessary to focus on indicators with the lowest scores.

To increase the UEQI in Muravlenko, it is necessary to pay attention to such indicators as:

- Public and business infrastructure and adjacent spaces;
- Green spaces;
- Housing and surrounding areas.

To improve these indicators it is suggested to do the following:

- It is necessary to consider the option of locating a shopping center;
- It is necessary to resettle citizens living in emergency housing into new houses built specifically for these purposes;
- It is necessary to design more green areas in the part of the city where they do not exist.

The implementation of these proposals will improve the UEQI in the city under study by increasing the comfort level of the city infrastructure.

References


2. K.A. Zhichkin, V.V. Nosov, L.N. Zhichkina, A.A. Gubadullin, The theory of agriculture multifunctionality on the example of private households. Agriculture (Switzerland), 12(11), 1870 (2022)


5. A. Gibadullin, V. Pulyaeva, Obstacles to the formation of a common electricity market of the Eurasian Economic Union. E3S Web of Conferences, 114, 02002 (2019)


