Study of the socio-economic living conditions of the rural population of the Krasnoyarsk Territory

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Abstract. This article examines the socio-economic sphere of life of the rural population at the level of the region and individual municipal districts. The aim of the work was to obtain objective assessments of the level of social and economic well-being of the rural population and determine the list of infrastructure facilities, the introduction of which will lead to an improvement in living conditions in rural areas. The object of the study was the rural areas of the Krasnoyarsk Territory and the quality of life of rural households. The research methodology was based on the use of the index method for aggregating data characterizing various aspects of the social well-being of a rural resident. As a result of the study, it was found that most of the rural population of the region under consideration lives in conditions that are significantly different from living in an urban environment. The disproportions in the level of income, housing improvement, the availability of social engineering infrastructure, and the availability of basic social services are highlighted. About 63% of rural residents do not have access to centralized water supply, heat supply and sewerage systems. The problem of wear and tear of fixed assets in healthcare, education, and transport infrastructure is critical. The highest degree of compliance of rural living conditions with urban standards of social comfort is observed in the regions of the Far North, which have a special legal status and industrial specialization of the territorial economy. Rural territories with a predominantly agrarian type of economy cannot provide the necessary volume of investment in fixed assets, mass employment and an acceptable level of income for rural households.

1. Introduction
Ensuring a high level and quality of life of the population, equal rights and opportunities for access to basic public and economic benefits is a priority task of any state. Modern problems of the socio-economic development of rural areas, ensuring the availability of social services and improving the standard of living of the rural population pose threats to the national internal interests of the Russian Federation, affect the social situation in the regions, and restrain the economic development of the state. Leading Russian scientists and researchers point out this in their works, for example, in the works of Sadykov [1], Plotnikova [2], Bobkov and others [3]. The current situation is aggravated by external negative factors: the COVID-19 pandemic, instability of world markets for raw materials and energy resources, volatility of exchange rates, a difficult geopolitical situation, sanctions pressure from Western states. In these difficult conditions, the implementation of domestic state policy should be targeted and verified, with an emphasis on supporting the general population. A comprehensive study of the spheres of life of the rural population and clarification of problematic positions in this direction makes it possible
to more effectively use limited budgetary resources, develop effective tools and mechanisms of social policy, and introduce modern standards of well-being and comfort of the villager.

Russian experts identify a number of distinctive features of the Russian Federation while ensuring equal living conditions for the population: the vastness of the occupied area, significant differences in natural and climatic conditions [4, 5], low population density, various types of settlement within the same region [6]. These factors affect the presence of visible imbalances in socio-economic development not only at the country level, but also within the boundaries of individual regions, as well as municipal districts.

2. Review of scientific research on the assessment of quality of life

The living conditions of the rural population as an object of research is considered most often within the framework of such categories as “quality of life” or “sustainable development of territories”. Among the main methodological approaches to solving this problem, the authors distinguish two main ones: objective and subjective. The first approach is based on the use of statistical data on the list of quantitative indicators, bringing them to a general integral index using weights for particular indicators. This approach identifies the category under consideration with such categories as "quality of life", "standard of living", "level of well-being". Among the significant works within the framework of this approach, the authors highlight the works [7], [8], [9]. The second approach brings together in a single assessment statistical data on groups of indicators and the results of the subjective perception of the population of their own well-being based on opinion polls and slices of public opinion. Weights between particular indicators are formed on the basis of expert assessments. This approach brings the category of quality of life closer to such categories as "lifestyle", "social well-being", "level of happiness." In the opinion of the authors, important works in the development of this approach are the works [10], [11], [12].

When examining ongoing research, one should look to quality of life projects carried out by academic institutions and rating agencies. For example, the Agency for Strategic Initiatives (ASI) is working on developing a rating of the quality of life of the population in the regions of the Russian Federation. The work is carried out on the instructions of the President of the Russian Federation V V Putin [13]. Presumably, the new rating will take into account the level of satisfaction of citizens with the social sphere, and most of its indicators will be based on surveys of citizens. The A A Nikonov All-Russian Institute of Agrarian Problems and Informatics has developed a rating of Russian regions in terms of the quality of life of the rural population [14]. The rating was compiled on the basis of 74 indicators characterizing the level and conditions of life, combined into 10 groups. According to this rating, the Krasnoyarsk Territory is 39th among all subjects of the Russian Federation. The Rating Information Agency (RIA) annually publishes a rating of the regions of the Russian Federation in terms of the quality of life of the population based on 70 indicators. The indicators are combined into 11 groups that characterize all the main aspects of living conditions in the region - from the level of economic development and the amount of income of the population to the provision of the population with various types of services and climatic conditions in the region of residence. The Krasnoyarsk Territory, according to this rating, took 38th place in 2019 (in 2018, the region took 45th place) [15]. The rating agency "National Credit Ratings" (NKR), on the basis of a calculated index, assesses the quality of life of residents in terms of personal well-being and the well-being of the environment, including social infrastructure. The ranking takes into account 10 key indicators. The Krasnoyarsk Territory is ranked 24th according to this rating [16].

The presented information confirms the importance and need for such research and determines the relevance of the work carried out by the authors of this article.

3. Purpose of the study

The purpose of the current study was to obtain objective assessments of the level of social and economic well-being of the rural population of the Krasnoyarsk Territory and determine the list of infrastructure facilities, the introduction of which will lead to an improvement in living conditions in rural areas.
4. Research methodology

For the study, 23 indicators were selected. The system of indicators was formed on the basis of the opinions of respondents based on the results of a sociological survey conducted by the authors and presented in [17], with adjustments to existing approaches to solving similar problems (table 1).

Table 1. The system of indicators for assessing the living conditions of the rural population of the Krasnoyarsk Territory.

| Group                      | Indicators                                                                 |
|----------------------------|-----------------------------------------------------------------------------|
| Standards of living        | The purchasing power of the average per capita income of the population (the ratio of the average per capita income to the subsistence minimum), times |
|                            | Consumption of food products and paid services per capita in value terms, rubles |
|                            | Rural unemployment rate, %                                                  |
| Health preservation        | The incidence rate of the population per 1000 permanent residents, people  |
|                            | Mortality rate per 1000 resident population, people                       |
|                            | The number of doctors of all specialties of rural hospitals per 10,000 rural populations, people |
|                            | Number of hospital beds for 24-hour hospitals per 10,000 population, pieces |
| Housing improvement        | Living area per inhabitant, square meters                                  |
|                            | Share of total area equipped with centralized heating, %                   |
|                            | Specific weight of the total area not equipped with water supply, %         |
|                            | Specific weight of the total area not equipped with sewerage, %            |
| Preschool education        | The share of children aged 1-6 years attending kindergarten, %              |
|                            | The share of children aged 7-17 years engaged in children's and youth sports schools, % |
| Depreciation of funds      | The share of the housing stock with wear and tear above 65%, %             |
|                            | Share of depreciation of fixed assets of organizations of municipal ownership, % |
|                            | Depreciation of water supply networks,%                                    |
| Ecological situation       | The total amount of pollutants from all stationary sources per 1 square kilometer of rural areas, tons |
|                            | Pollutants emitted into the atmosphere from stationary sources per 1 villager, tons |
|                            | Percentage of trapped and neutralized pollutants from the total amount of pollutants emitted from stationary sources, thousand tons |
| Social engineering         | The number of separate subdivisions of cultural and leisure-type organizations per 10,000 people, units |
| infrastructure            | Number of sports facilities per 10,000 people, units                       |
|                            | The share of roads that do not meet regulatory requirements, %              |
|                            | The proportion of public roads of local importance with hard surface in the total length of public roads of local importance, % |

The information base for the collection of indicators was formed by data from the Federal Statistics Service for the Krasnoyarsk Territory. To conduct the assessment, an index approach was chosen, the implementation of which was carried out according to the following algorithm.

Step 1. Normalization of the initial values of the selected indicators

Normalization of indicators is necessary for unification and comparison in comparative assessment. The basis for standardizing the selected indicators was the values of these indicators for the urban environment in the region. The normalization formula is as follows:

\[
X_{\text{real}} \rightarrow X_{\text{normalized}} = \frac{X_{\text{real}}}{X_{\text{basis}}} \quad \frac{X_{\text{basis}}}{X_{\text{real}}} \quad (1)
\]

\[
X_{\text{real}} \quad \text{the value of the corresponding indicator for the area under consideration;}
\]

\[
X_{\text{basis}} \quad \text{the value of the corresponding indicator for the urban environment in the region.}
\]
Formula (1) is applied if for the value of a particular indicator the following condition is met: "the higher the value of the indicator, the better it is." Examples of indicators: per capita income, provision of places in kindergartens, provision of doctors, etc.

Formula (2) - if for the value of a particular indicator the following condition is met: “the lower the value of the indicator, the better”. Examples of indicators: morbidity rate, unemployment rate, pollutant emissions, etc.

Step 2. Calculation of indices based on normalized indicators in the context of the regions of the Krasnoyarsk Territory.

To calculate the indices, it was decided to focus on the most frequently used approach - the use of the geometric mean value.

a) private indices based on normalized indicators:

\[ I_{ij} = \sqrt[n]{\prod_{j=1}^{n} X_{ij}^{\text{normalized}}} \]  

(3)

b) composite index based on private indexes:

\[ I_{ILC_i} = \sqrt[n]{\prod_{j=1}^{n} I_{ij}} \]  

(4)

ILC (index of living conditions) - an index of the quality of living conditions;
n is the number of indicators that make up the private index;
i is the ordinal number of the municipal district in the data array;
j is the ordinal number of the indicator / private index in the data array.

Thus, in the chosen methodology, the comparison base is the values of indicators of living conditions in cities, the indices themselves and a set of indicators are the degree to which rural areas correspond to the minimum urban standards of well-being in the region.

5. Research results

The statistical characteristics of the rural areas of the region according to the selected indicators are presented in table 2.

Table 2. Statistical characteristics of indicators of the socio-economic sphere in the countryside of the Krasnoyarsk Territory.

| Indicators                                                                 | Statistical characteristics for 2019 |
|---------------------------------------------------------------------------|-------------------------------------|
| The purchasing power of the average per capita income of the population    | Average | Maximum | Minimum | Median |
| (the ratio of the average per capita income to the subsistence minimum),  | 1.7     | 6.2     | 1.1     | 1.3    |
| times                                                                     | times   | times   | times   | times  |
| Consumption of food products and paid services per capita, rubles          | 48054.3 | 121195.1| 26089.2 | 43211.6|
| Rural unemployment rate, %                                                | 10.3    | 22.2    | 3.1     | 10.2   |
| The incidence rate of the population per 1000 permanent residents, people| 679.2   | 1430.0  | 251.1   | 663.9  |
| Mortality rate per 1000 rural residents, people                          | 15.7    | 18.8    | 9.4     | 16.5   |
| The number of doctors of all specialties per 10,000 people, people        | 23.2    | 47.7    | 1.3     | 23.3   |
| Number of hospital beds for 24-hour hospitals per 10,000 population, units| 58.5    | 231.4   | 13.4    | 51.3   |
| Living area per inhabitant, square meters                                | 25.7    | 31.2    | 19.9    | 25.9   |
| Share of total area equipped with centralized heating, %                  | 24.0    | 88.4    | 0.3     | 20.9   |
Specific weight of the total area not equipped with water supply, %
53.1 96.4 12.4 50.0
Specific weight of the total area not equipped with sewerage, %
68.4 98.3 12.4 71.0
Share of children aged 1-6 years attending kindergarten, %
54.1 78.9 30.4 53.6
The share of children aged 7-17 years engaged in children's and youth sports schools, %
10.0 31.3 0.2 8.5
The share of the housing stock with wear and tear above 65%, %
29.4 72.5 3.5 27.4
Share of depreciation of fixed assets of organizations of municipal ownership, %
48.6 83.8 18.1 47.4
Depreciation of water supply networks, %
48.8 77.8 6.8 53.7
The total amount of pollutants emitted from all stationary sources per 1 sq. km of rural areas, tons
2061.8 28686.8 0.5 207.2
Pollutants emitted into the atmosphere from stationary sources per 1 villager, tons
423.4 6939.5 0.8 81.4
Percentage of trapped and neutralized pollutants of the total amount of pollutants emitted from stationary sources, %
21.5 87.5 0.4 17.5
The number of separate subdivisions of cultural and leisure-type organizations per 10,000 people, units
16.4 55.1 1.4 12.8
Number of sports facilities per 10,000 people, units
29.9 51.1 13.6 29.0
The share of roads that do not meet regulatory requirements, %
45.7 82.9 5.0 45.1
The proportion of public roads of local importance with hard surface in the total length of public roads of local importance, %
71.1 100.0 29.1 72.5

The results of calculating the habitat quality index according to the presented method are shown in table 3.

**Table 3.** Grouping of districts by the quality of living conditions of the rural population.

| Rural population, people | ILE Index Value Intervals | (0.0;0.2) | (0.2;0.4) | (0.4;0.6) | (0.6;0.8) | (0.8;1) |
|------------------------|--------------------------|-----------|-----------|-----------|-----------|---------|
| Central group of regions (acceptable natural and climatic conditions) | Balakhinskii (0.5997); Manskiy (0.5545); Sukhobuzimskii (0.5512); Bolshemurtinskii (0.5128) | 6714 | 505310 | 279844 | 77717 |
| Southern group of regions (favorable natural and climatic conditions) | Minusinskiy (0.5939); Krasnoturanskiy (0.3813); Sharypovskii (0.5784); Kuraginskiy (0.5049); Ermakovskii (0.4727); Idrinskiy (0.4414); Karatuzskii (0.4388) | Berezovskii (0.6806); Emelianovskii (0.6796); Novoselovskii (0.6102) | | | |
The districts are divided into geographical groups within the Krasnoyarsk Territory, with the specification of the natural and climatic conditions of residence. For each region, the values of the general index are indicated in brackets, and the regions themselves are ranged by the value of the index. Also indicated is the number of the rural population, which fell into the corresponding interval group by the value of the index. The greatest compliance with urban living conditions is observed in rural areas of four districts: Taimyr Dolgan-Nenets District, Severo-Yeniseisky District, Turukhansk District and Kezhemsky District. All these areas have similar characteristics in common: low population density, but high concentration in settlements; the presence of large industrial facilities; the predominance of industrial production and employment; special legal regime (areas are located in the zone of the Far North or areas equated to the Far North). For a large group of districts (28 districts with a predominantly agrarian specialization of the economy), the index value is in the range of 0.4-0.6, which indicates the presence of significant differences in the living conditions of the rural population compared to the urban population. The presence of such a significant number of districts (58%) with low index values is an objectively negative characteristic of the level of socio-economic development. Given the low current positions of the Krasnoyarsk Territory in various ratings of the quality of life presented earlier in this work, it can be concluded that the majority of the rural population, about 91%, lives in unfavorable socio-economic conditions and experiences significant difficulties in ensuring their own well-being and comfort.

The calculation of the need of rural areas in the region for additional objects of social and engineering infrastructure to meet the minimum standards of security is shown in figure 2.
The need for social and engineering infrastructure in rural areas of the Krasnoyarsk Territory to meet the minimum standards of security.

It is expected that in the medium term, the situation will be aggravated by external shocks and reduced funding for national projects.

6. Discussion

The analysis of the assessment results allows the authors to identify the key problems in ensuring the basic living conditions of the rural population:

- Insufficient investment activity of agricultural organizations. Investments are the basis for the formation of the material and technical base in the development of rural areas. Low values of accumulated investment in fixed assets over a five-year period indicate the absence of an economic basis for growth in production volumes, which negatively affects the possibilities for a rapid socio-economic breakthrough in rural areas.
- The lag of agricultural regions in terms of value of production. Comparatively low (relative to industrial areas) volumes of production of goods and services in rural areas with agrarian specialization do not create an economic basis for development at the expense of their own entrepreneurial income.
- Low incomes and the problem of rural employment. Relatively low investment activity and production indicators in value terms lead to the lag in rural areas in terms of average per capita income. In addition, limited types of economic activities exacerbate the problem of rural unemployment.
- The problem of effective demand in rural areas. Low incomes of the rural population and high unemployment lead to a contraction of aggregate consumption and insufficient, for sustainable development, demand in retail trade and services.
- Inconsistency of housing conditions with the minimum level of improvement (availability of centralized water supply, heat supply, sewerage systems). Most of the rural population cannot
provide for itself the expansion of living space and the creation of housing comfort conditions close to the urban minimum standards of well-being.

- Lack of social infrastructure facilities - kindergarten places, sports facilities, leisure infrastructure and healthcare facilities (especially for settlements with less than 100 people).
- The ecological situation in the countryside. In areas with developed industry, there is a deterioration in the overall environmental situation, and in areas with agrarian specialization there is a lack of environmental infrastructure.
- The health status of the rural population. Household budget constraints on the consumption of high-quality products (due to low incomes), a narrow range of food diversity in rural retail chains (due to low purchasing power of demand), a lack of doctors and a limited list of medical services in rural areas, an unfavorable environmental situation leads to a deterioration in the health of rural population, an increase in morbidity and mortality in rural areas.
- The outflow of the able-bodied rural population. These trends lead to increased migration of the able-bodied population of rural areas and a change in its age structure, which creates threats of an intensification of the demographic crisis.
- Growth in the number of small rural settlements. Demography and migration increase the share of small rural settlements, which creates an additional burden on the budgets of all levels to maintain the necessary state of infrastructure facilities (in some cases, already excessive) and fulfill social obligations.

In accordance with the analysis and the identified disproportions in the development of rural areas, taking into account the grouping and typology adopted in the study, the main directions of the development of living conditions were identified:

- creating conditions for increasing investment activity in rural areas;
- maintaining the rural population at the current level in the medium term with an improvement in the age structure due to the return migration of the young population;
- equalization of disparities in housing conditions and social infrastructure of rural areas.

It requires concentration on three key levels:

- Encouraging business investments (primarily agricultural) in fixed assets and their own human capital.
- Increasing budgetary spending on social infrastructure.
- Encouraging the rural population to invest in their own housing stock.

In the medium term, the following priorities for the development of territories have been identified, which should be implemented at the expense of the budget:

- increasing coverage and accessibility of the population with preschool educational services;
- increasing the availability and quality of healthcare services;
- development of transport infrastructure in rural areas;
- solving problems with water quality in rural areas;
- development of communal infrastructure in rural areas.

7. Conclusion
The presented results confirm the existence of significant disparities in social well-being and comfort between rural and urban environments. At the same time, the gap in living conditions continues to widen. The study is intended for the scientific community to study the problems of poverty, the quality and standard of living of the population, representatives of relevant departments and ministries, heads of
municipalities, as well as the rural population. The results of this work can be applied in drawing up regional and municipal programs for the development of rural areas, developing standards for the quality of life and well-being of the rural population, as well as for continuing research in this direction.

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