Quality of life of the rural population of the Krasnoyarsk Territory: assessment, trends and priorities

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Abstract. The article presents the results of studying the problems of the quality of life of the rural population in the Krasnoyarsk Territory. A feature of the work is the conduct of research at the level of individual municipal districts of the region. In accordance with the research methodology, the authors formed an initial list of indicators of quality of life. Using the index method of data aggregation, quantitative indicators of the quality of life and its individual components were obtained for the rural population as a whole in the region, as well as within the municipal districts. The main results of the work: the rural population of the region lives in extremely unfavourable conditions. The most critical is the situation with the provision of the rural population of the region with teachers, consumer services, and the availability of infrastructure for child development and upbringing. The consumption of goods and services is low compared to the urban environment, there is a high level of rural unemployment (over 13%) and the general morbidity of the population (679 new cases per 1000 people annually). The share of living space provided with minimum centralized communal conditions does not exceed 27%, about 89.3% of the rural population have difficulties in obtaining high-quality medical services. For only 3 out of 44 municipal districts, the quality of life of the rural population can be defined as acceptable. Among the main proposals of the authors: revision of the system of redistribution of tax revenues by budgeting levels; increasing the share of regional budget expenditures on rural areas from the current 4.78% to 15%; creation of special institutional conditions for rural areas, through a special regional law and an interdepartmental regional development program.

1. Introduction
The issues of assessing the quality of life are becoming increasingly important in connection with the priority of national policy at the level of the country and individual regions. In the works of foreign scientists, for example [1, 2], the quality of life of the rural population is inextricably linked with the concept of sustainable development of rural areas. The specifics of budget allocation in the EU countries predetermines a unified approach to financing all rural areas within the framework of the Unified Agrarian Policy [3]. The developed policy also does not exclude problems in the development of rural areas and the quality of life of the population, which lie in institutional constraints.

The issues of improving the quality of life and their importance for the development of agriculture, ensuring sustainable development of rural areas, and preserving spatial integrity are addressed by domestic researchers, among whom the authors highlight the works [4], [5], [6]. Most scientific approaches boil down to the search for mechanisms to ensure sustainable development of agricultural production in rural areas, through the deepening of processing, diversification of the rural economy [7, 8], the development of cooperation and rural micro clusters [9, 10], the transition to export-oriented
strategies in agriculture [eleven]. These areas, according to the designated researchers, will become a condition for improving the quality of life.

The authors of this study believe that the main task is to ensure the return migration of the population to rural areas. This requires that individual living conditions are substantially better than in an urban environment. First of all, it concerns the level of income and infrastructure for the development and upbringing of children. The approach to assessing the quality of life of the rural population should be comprehensive, with mandatory sociological research. The determining factor in assessing the quality of life should be the assessment of the degree of satisfaction of the local population with the processes of life in rural areas [12]. The current fragmentation of the state of the social and engineering infrastructure, differences in the provision of educational institutions, social services, health infrastructure, cultural objects in rural areas predetermines the existing socio-economic differentiation of rural areas in the region [13]. Determination of priority areas for improving the quality of life is paramount in the distribution of measures of state support for sustainable development of rural areas [14]. The experience accumulated by the authors in the study of rural areas made it possible to determine the methodological approaches and principles of assessment.

2. Purpose of the study
The purpose of the current study was to obtain quantitative measurements of the quality of life of the rural population at the regional level on the basis of the author's approach and to identify disparities between municipal districts, as well as to formulate the main directions for developing strategic measures to improve the well-being of rural residents.

3. Research methodology
For the research 20 indicators were selected, classified into 6 groups. 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 [15], with adjustments to existing approaches to solving similar problems [16, 17, 18]. Further, the current values of these indicators in the regions of the Russian Federation were analysed and, on the basis of data synthesis, threshold values were established that meet the requirements of an acceptable quality of life (table 1).

Table 1. The system of indicators for assessing the living conditions of the rural population of the Krasnoyarsk Territory.
It should be clarified that the threshold values for indicators of housing conditions should be close to 100%, but the authors make the following assumption. Based on the current indicators of the provision of communal infrastructure, as well as the presence of individual communal facilities in the private residential sector (own heating systems, individual water supply), the threshold values should be set exactly at the presented level.

Rural areas were studied in all 44 municipal districts that make up the Krasnoyarsk Territory. The study was carried out using the index method to obtain a comparative assessment of the quality of life of the rural population in the municipal districts of the region. The essence of using the index method is as follows:

Stage 1. Indicators are reduced to dimensionless form (standardized).

The following formula was used:

\[ X_{\text{real}} \rightarrow X_{\text{normalized}} = \frac{X_{\text{real}}}{X_{\text{basis}}} \]

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\( X_{\text{real}} \) is the value of the corresponding indicator for the area under consideration;

\( X_{\text{basis}} \) is the threshold value for a particular indicator.

Formula (1) is applied if for the value of a particular indicator the following condition is met: “the value of the indicator is higher than the threshold, the better”.

Formula (2) - if for the value of a particular indicator the following condition is met: “the value of the indicator is lower than the threshold, the better”.

Stage 2. Partial indices and composite indices are calculated.

Partial indices (group) were calculated as the arithmetic mean of the normalized indicators.

The composite index based on private indices was calculated as the geometric mean:

\[ IQL = \sqrt[6]{I_{Q_{i}}} \quad i = 1, ..., 6 \]

\( IQL \) – index of quality of living conditions;
\( IQ \) – private (group) indices.

The value of each index (private and composite) was recognized in accordance with the following scale (table 2).

### Table 2. Scale of recognition of values of private and composite indices.

| Intervals for index values | Interpreting the meaning          |
|---------------------------|-----------------------------------|
| (0;0.2)                   | Critical                          |
| (0.2;0.4)                 | Low                               |
| (0.4;0.6)                 | Below the average                 |
This approach was applied for the average values of the indicators in table 1 for the rural areas of the Krasnoyarsk Territory as a whole, as well as separately for the municipal districts of the region.

4. Results of the study

4.1. Assessment of the quality of life of the rural population at the regional level
Table 3 presents the results of calculating the average values of indicators from table 1 for the rural areas of the Krasnoyarsk Territory as a whole, the normalized values of these indicators and determined by the formula of the arithmetic mean partial indices.

Table 3. Assessment of the components of the quality of life in rural areas of the Krasnoyarsk Territory.

| Indicators                                                                 | Rural average | Normalized value | Private indexes                              | Value     |
|---------------------------------------------------------------------------|---------------|------------------|----------------------------------------------|-----------|
| Average per capita income by purchasing power, rubles                      | 2.08          | 0.52             | IQ1 - Living Standards Index                  | 0.278     |
| Annual consumption of food products and paid services per capita, rubles   | 51142.21      | 0.17             |                                              |           |
| Unemployment rate, %                                                       | 10.29         | 0.24             |                                              |           |
| The number of newly diagnosed diseases of the population per 1000 people,  | 679.19        | 0.29             | IQ 2 - Rural health index                     | 0.426     |
| times                                                                     |               |                  |                                              |           |
| The general mortality rate, ppm                                           | 15.69         | 0.64             |                                              |           |
| Average duration of 1 case of temporary disability, days                  | 17            | 0.41             |                                              |           |
| The number of doctors of all specialties per 10,000 people of the population, people | 23.22         | 0.46             | IQ 3 - Medical services accessibility index   | 0.555     |
| Number of hospital beds per 10,000 people, pieces                         | 58.48         | 0.78             |                                              |           |
| The number of medical and preventive organizations per 1000 people, units | 1.42          | 0.47             |                                              |           |
| Living area per inhabitant, square meters / person                        | 25.74         | 0.86             |                                              |           |
| Share of area of rural housing stock equipped with centralized heating, % | 23.98         | 0.40             | IQ 4 - Housing quality index                  | 0.515     |
| Share of rural housing stock equipped with water supply, %                | 46.92         | 0.52             |                                              |           |
| The proportion of rural housing stock equipped with sewerage              | 31.58         | 0.39             |                                              |           |
| Share of children attending kindergarten, %                               | 55.56         | 0.74             | IQ 5 - Child development and education infrastructure state index | 0.316     |
| Share of children attending children's and youth sports schools, %         | 9.25          | 0.62             |                                              |           |
| The number of teachers of children's music, art, choreographic and art schools per 1000 children aged 0-17 years, people | 3.24          | 0.32             |                                              |           |
| The number of teachers per 1000 children aged 7-17, people                | 9.42          | 0.07             |                                              |           |
| Share of the population provided with water of standard quality, %        | 76.34         | 0.90             |                                              | 0.763     |
The level of compliance with the regional standard for the provision of retail space, %

| The number of objects of rendering personal services per 1000 people, units | 1.67 | 0.33 |

Analysing the standardized indicators of the quality of life of the rural population, it should be noted that the situation with the provision of the rural population of the region with teachers (the value of the standardized indicator is 0.07), the consumption of goods and services (0.17), the unemployment rate (0.24), and the general morbidity of the population (0.29) is the most critical. The degree of compliance with the threshold values of indicators of the provision of communal infrastructure, the availability of facilities for the provision of public services, the number of teachers of children's music, art, choreographic schools and art schools should be recognized as low. Of the selected indicators, only three have a value that is assessed as high: the provision of water of standard quality, the provision of retail space and the provision of living space.

The analysis of the values of private indices allows to assess the general situation in the sphere of vital activity. The lowest compliance with the minimum standards is observed in the indices of the standard of living (0.278), as well as the infrastructure of child development and education (0.316). The values are close to the critical level, which creates threats to social and economic security for rural areas of the region. The values of the health index of the rural population, the quality of housing conditions, and the availability of medical services are estimated below the average. The availability of basic goods (water, retail space) can be estimated as an average.

No index has a high value, which indicates the presence of significant problems in the quality of life of the rural population of the region as a whole. The calculation of the composite index of the quality of life according to the formula (3) is given below:

\[ IQL = \frac{1}{6} \times 0.278 \times 0.426 \times 0.555 \times 0.515 \times 0.316 \times 0.763 = 0.449 \]

The resulting value on the scale of table 2 is recognized as below average. That is, the quality of life of the rural population of the Krasnoyarsk Territory is extremely unsatisfactory.

4.2 Results of the study for municipal districts of the Krasnoyarsk Territory

Similar calculations were carried out for each of the 44 municipal districts of the Krasnoyarsk Territory. Figure 1 shows scatter diagrams and a histogram of the distribution of areas by intervals of index values.

The main results of the analysis are presented in the form of theses:

- **Index of living standards IQ1.** A high value of the index (more than 0.8) is observed in only two districts of the region: Severo-Yenisei (rural population 3.64 thousand people) and Turukhansk (rural population 11.8 thousand people). The critical value of the index (less than 0.2) was recorded in the Kansk district, and the Karatuz, Taseevsky, Idrinsky and Ermakovsky districts reached the critical level of values for this index. In general, a low standard of living was recorded in 34 out of 44 districts, and the total number of all rural residents in these districts is 443.06 thousand people (69.7% of the total rural population of the region). In another eight districts (from the Krasnoyarsk agglomeration and the northern zone of the region), the standard of living is assessed as below average.

- **Rural health index IQ2.** A high value (more than 0.8) was not recorded in any district of the Krasnoyarsk Territory. The average value of the index is observed in five districts: Minusinskiy (0.7), Nazarovskiy (0.65), Kanskiy (0.63), Severo-Yeniseiskiy (0.62) and Taimyr (0.6). In other districts (in 39 out of 44, 86.6% of the rural population of the region), the value of the index is assessed as below average (from 0.4 to 0.6). The general conclusion is that residents of rural areas have significant health problems, which negatively affects the reproductive potential and quality of human capital in rural areas.
Figure 1. Scatter diagrams for municipal districts according to the values of private indices and graphs of interval frequencies.

- Medical Services Accessibility Index IQ3. High rates of accessibility of medical services for the rural population were recorded in Nizhneingash, Evenk, Sukhobuzim and Kazachinsky districts. Three more districts have indices close to the border of high values: Taimyr, Bolsheuluisky and Pirovsky. Average values of the index are observed in 9 out of 44 districts (the population of these districts is 94.8 thousand people or 14.9%). In 27 districts the value of the index is assessed as below average and in 4 districts as low. In general, an unfavourable situation with the availability of medical services takes place for 568.6 thousand of the rural population of the region (89.3%).

- Housing Quality Index IQ4. High values of the index were recorded for rural residents of 4 districts of the Krasnoyarsk Territory, average values for 10 districts, below the average for 22
districts and low for 8 districts. Thus, in rural areas, only a small proportion of households (no more than 27%) have access to centralized heating, water supply and sewerage networks.

- Index of Infrastructure for Child Development and Education IQ5. Only in the Severo-Yenisei region the value of the index is more than 0.8. For another four regions, this value is in the range from 0.6 to 0.8. In 21 districts, access to the infrastructure of children's education is noticeably limited, and in 18 districts it is significantly limited. There is a widespread shortage of rural teachers, teachers of art and music schools. Coverage of kindergarten services is extremely low due to restrictions on transport mobility and the remoteness of rural settlements from regional centres.

- Index of accessibility of basic services IQ6. None of the districts has high values for this index. In 27 districts, its value is taken as average (from 0.4 to 0.6), in 17 districts as low. For two districts (Motyginsky and Nazarovskiy), the index value is very close to the critical level.

- Consolidated index of quality-of-life IQL. In three districts of the Krasnoyarsk Territory, the quality of life is assessed as average (acceptable): Severo-Yenisei District, Turukhansk District, Evenki District. At the same time, all these areas are located in the zone of extreme natural and geographical conditions (the Far North), which negates the advantages of the local rural population over residents of other areas. In 27 municipal districts, the quality of life of the rural population is assessed as low. The total number of the rural population living there is 408.2 thousand people (64.1%). In another 14 districts (population 198.4 thousand people), the quality of life is very low. The most unfavourable situation has developed in two districts of the western part of the region (Achinsky and Bogotolsky), as well as in two districts of the eastern part (Kansky and Dzerzhinsky).

In general, the situation in the rural areas of the Krasnoyarsk Territory is quite difficult and requires both operational and strategic decisions.

5. Discussion
A set of measures of a different nature is required to eliminate disparities in the quality of life between rural and urban populations, as well as between rural areas of different municipal districts. In addition, it is necessary to correct the general negative situation in all spheres of life and life support of rural areas. The authors see the solution to the problems of the quality of life in the following measures.

Expansion of the powers of the constituent entities of the Russian Federation on social policy in rural areas. For the most part, all the main activities, as well as their financing, take place through state development programs. Regions in this system are endowed with minor powers, and also experience significant financial difficulties. At the moment, the existing system of consolidation of most of the tax revenues in the Federal budget and the subsequent "non-transparent" scheme of their partial redistribution between the regions led to the fact that most of the RF subjects were in debt to the Federal budget. The total amount of debt amounted to 2.439 trillion. rubles (2.2% of GDP) as of May 1, 2021. In such conditions, it depends on the Federal Centre how and who will develop, and who will remain outsiders in terms of quality of life.

Revision of the mechanism for the redistribution of tax revenues between the budgets of different levels: federal, regional and municipal. The federal budget receives two major taxes: value added tax and mineral extraction tax. The regional budget is replenished at the expense of 85% of personal income tax and income tax, as well as grants and subsidies, which can cover up to 80% of all budget expenditures. Municipal budgets receive only 15% of personal income tax and negligible local taxes and fees. And in these conditions, municipalities do not have any of their own financial resources to solve pressing local problems.

There is a need for a significant increase in financing for rural areas in the region. At the moment, there are 22 state development programs on the territory of the Krasnoyarsk Territory, among which 17 state programs contain separate measures for the development of rural areas. At the same time, in monetary terms, the share of expenditures of the consolidated budget of the Krasnoyarsk Territory on
rural areas through these state programs is 4.78% of all expenditures. According to the authors, an increase in funding is required up to at least 15%, which is equivalent to an increase from 9.2 billion rubles to 28-30 billion rubles a year.

Rejection of the "optimization principle" in the social sphere for rural areas. The main principle of reforming the social sphere at the moment is the "principle of optimization", in which the emphasis is on economic efficiency to the detriment of the social component. This leads to a massive reduction in the number of nurses, rural doctors and teachers, workers in the cultural and leisure sector. The remaining employees are forced to work at 2-3 rates in order to cover the need for services from the rural population. Another result is a noticeable decline in the quality of the services provided. In rural areas, it is necessary to return to the previous standards for the number of personnel in public social institutions. At the same time, wages for such workers in rural areas should be at least 20% higher than in cities.

In regional legislation, it is necessary to consolidate the concept of "rural resident" and clarify the criteria for assigning the population to this category. This will create a legal basis for targeted support of the rural population.

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The development of the regional law of the Krasnoyarsk Territory "On measures to introduce a system of regional social standards for servicing the rural population" is required, which will spell out the norms and standards for providing rural residents with the main objects of social, engineering, communal and leisure infrastructure.

For interdepartmental interaction between the executive authorities of the Krasnoyarsk Territory and local self-government bodies of the municipal districts of the region in connection with the implementation of powers to ensure sustainable development of rural areas, the adoption of the regional interdepartmental program "Comprehensive Development of Rural Territories of the Krasnoyarsk Territory" is required. This program will allow to combine in a single document all areas of development of rural areas and simplify financing mechanisms.

6. Conclusion
It has been established that in the Krasnoyarsk Territory a significant part of the indicators of the quality of life of the rural population is in the critical zone. Within the region, at the level of municipal districts, there are minor disparities between 3 districts with an industrial type of economy, 2 districts with a multifunctional development model and the remaining 39 districts with an agricultural specialization. In general, a significant part of the rural population in the region, regardless of the municipal district, lives in conditions of low quality of life. The results are intended for research in the field of regional economics, the study of the well-being of the population, the socio-economic development of rural areas. The areas of application of the results are targeted programs of regional development, strategic planning of the territorial economy, decision-making to improve the living standards of the rural population.

Acknowledgments
The study was sponsored by the regional state autonomous institution "Krasnoyarsk regional fund of support for scientific and technical activities".

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