

## METHODOLOGICAL APPROACH TO MEASURE THE QUALITY OF LIFE OF THE REGION'S POPULATION

*The article is devoted to the urgent problem of the regional development, i.e. to the development of methodological tools to evaluate the quality of life of the population in the region. The article considers the concept of "quality of life", and the terms related thereto; and substantiate the author's position with respect to the concept. The existing domestic and foreign approaches to evaluate the quality of life of the population were analyzed, and the application of the comprehensive approach was reasoned within this study. The criteria for evaluation of the quality of life of the population were distinguished. The authors proposed the methodological approach that considers not only objective indicators of the quality of life presented in the statistical reports of the Russian Federal State Statistics Service, but also employs subjective evaluations of the local population enabling more appropriate evaluation of the quality of life in the region. The methodological tools of the research include mathematical methods of statistical data processing and online survey of the population about the level of satisfaction with various aspects of their life. The methodological tools were tested using the example of the Sverdlovsk Region that is characterized both by the steady improvement of statistical indicators of the quality of life and by low satisfaction of population with certain aspects of the quality of life, which generally decreases the integrated indicator of the quality of life despite positive dynamics of social and economic development of the region and vigorous social policy of the regional authorities. The proposed methodology was used in the evaluation of the quality of life of the Sverdlovsk Region population as part of the development of the Concept of comprehensive regional program "New quality of life of Ural residents" (Decree of the Governor of the Sverdlovsk Region No. 45-UG dated January 29, 2014 "On the Concept of the life quality improvement for the Sverdlovsk Region population before 2030 year – "New quality of life of Ural residents").*

**Keywords:** quality of life, region, subjective evaluation, methodological approach, diagnostics

### Introduction

At present, the task of the population life quality improvement is one of the key tasks in social and economic policy of the Russian Federation and its constituent entities.

Among the factors that led to negative changes in the level and quality of life of the Russian population, the researchers mention the following: high pace of economic reforms accompanied with increased neuropsychic and stress impacts on an individual, deepening of all forms of social and economic inequality; wide prevalence of health-destructive behavior patterns related primarily to the alcohol consumption; critical state of the health care system [1, p. 284].

The state social policy is to address these and other problems. This policy is one of the most important spheres of social and economic life of society. It is designed to promote the social justice, to form the system of social protection, to provide conditions for population well-being growth. The effectiveness of the social policy is manifested in the level and quality of life of population that directly affects the sustainable development of the region (the balance of social, economic, institutional and environmental aspects) [2, p. 165–166; 3].

The Concept of long-term social and economic development of the Russian Federation for the period until 2020 specifies that the personal income and the quality of life of Russians by 2020 should reach the levels characteristic for the developed economies. The relevance of the population life quality improvement in the Sverdlovsk Region is caused by a traditional discrepancy between economic potential (particularly, industrial potential) and social development of the region. In 2013, at the regional level, it was decided to draft a comprehensive regional program – "New quality of life of Ural residents" – aimed at improving the social well-being of the region inhabitants. Principally, it refers to the improvement of health, education, culture, social support of citizens, employment assistance, and providing affordable and comfortable housing<sup>1</sup>.

<sup>1</sup> On the Concept of the life quality improvement for the Sverdlovsk Region population before 2030 year – "New Quality of Life for Ural Residents". Decree of the Governor of the Sverdlovsk Region No. 45-UG dated January 29, 2014. Available at: <http://www.oblgazeta.ru/>

The formulation of the problem has identified the need in the elaboration of the methodological tools to obtain objective information on the current situation related to the level and quality of life of the population.

### **Theory and Methodology**

A great number of gnoseologically similar concepts exist in the academic literature devoted to the study of the quality of life. For example, such a concept as “the way of life” reflects the forms of life activity typical for certain social, economic, political, ethnic relations and characterizing life peculiarities of certain categories of the population [4, p. 56]. The concept is composed of various social, economic, cultural and social forms [5, p. 5–32; 6]: 1) labor; 2) consumption of goods and services; 3) family, everyday life and leisure; 4) health and environment protection; 5) education and culture; 6) science and art; 7) social and political activity, etc.” [7, p. 44].

The concept “environment quality” represents “a set of elements, prerequisites, and factors required for the formation of the environment and at the same time acting as a prerequisite for healthy, harmonious and intense social life of an individual. The quality of the environment is an integral part of the characterization of the quality of life of the population made through objective evaluation” [4, p. 58].

“The social standard of living” as a comprehensive social and economic category reflects the level of physical, spiritual and social needs and the degree of their satisfaction, as well as social conditions for the development and satisfaction thereof [8, p. 4–12; 9]. Tangible and intangible benefits and services [10, p. 50] are considered as means of needs satisfaction. When analyzing the quality of life, the quality of work life has an essential role, including the conditions of work that allow the consideration of the extent of an employee interests realization and of the use of his/her intellectual, creative, moral, organizational capabilities, etc. The quality of work life is expressed in the feeling of job satisfaction, the desire of an individual to improve his/her competence and skills [11].

The population characterization as a subject of life activity, social production and social relations is reflected in such a concept as the “population quality” that determines its ability to react to natural, technological, economic, social and cultural conditions and to adapt them to personal ever-changing needs, and the population characteristics takes the form of observable and quantitative parameters (fertility and mortality, marriage and divorce rates, education and qualification levels, etc.) [12].

The quality of life is closely related to the realization of a person not only as a producer and a consumer of different products and services, but also as an integral personality who creates his/her life and the life of his/her family, of the whole society and of the country in general [19], which requires, when assessing this phenomenon, to consider the satisfaction of the need for creativity, self-development and self-realization by a person of his/her abilities.

Therefore, the concept “Quality of life of the population” includes the elements of all the above categories. However, in order to be able to assess the current quality of life in the society, all its elements should be formulated as the desired “standard of life” [11, p. 5], which should have a common basic level of personal and social needs satisfaction with the possibility of its quantitative assessment.

The analysis of the quality of life concepts and their components represents three formed methodological approaches to its measurement and evaluation.

1. The subjectivist approach, or “perceived” quality of life. The latter is determined through the evaluation by a person of the extent of his/her needs satisfaction, which depends on different people’s ideas about the quality of life. For some people, it means the high level of spiritual development primarily, and for other people — material well-being. In this case, the “quality of life” remains at the level of ordinary consciousness and is identified as individual understanding of the “good life”. One of the best-known definitions based on subjective assessment was given by the World Health Organization (WHO). According to it, the quality of life is defined as people’s perception of their place in life depending on the cultural specifics and value system, their goals, expectations, standards and concerns [12, p. 6]. From this point of view, the quality of life is the level of a person satisfaction with his/her life based on his/her own subjective self-assessment that depends on the social microenvironment with which he/she identifies himself/herself.

2. Objectivist approach. The quality of life in this case is close to the notion of the standard of life and is measured mainly using indicators that are developed by official statistics and demonstrate the extent of each individual's provision with material resources, transport and social infrastructure, housing, clean air and water through the evaluation of a range of objective indicators by other people that have comprehensive and reliable information and required skills, i.e. by the team of experts [19, 20].

3. Integrated approach. The quality of life is determined by the synthesis of the first two approaches to its definition, in particular, through a set of life values characterizing the creative activities, needs meeting and people satisfaction not only with living conditions, but also with social relations within the confines of which they build their lives. Traditionally, the quality of life is considered as a generalized social and economic category that includes not only the level of consumption of goods and services (standard of living), but also the satisfaction of spiritual needs, health, duration of life, environment conditions, moral and psychological climate, peace of mind and is evaluated both by the level of a person satisfaction with his/her life based on his/her own subjective self-assessment [21] and by the system of objective indicators that determine the current standard of living operated by statistics.

### **Technique**

The integrated approach to the quality of life measurement provides for the comparison of objective and subjective evaluations enabling formation of the database for the quality of life analysis achieved by the society and the appropriateness of its perception by the population. That's why the integrated approach of the quality of life measurement was used in this study.

The study findings were used for the development of a comprehensive program of the life quality improvement of the Sverdlovsk Region population (the Decree of the Governor of the Sverdlovsk Region No. 45-UG dated January 29, 2014 on the Concept of the life quality improvement for the Sverdlovsk Region population before 2030 year — “New quality of life of Ural residents”). The Concept and the program were developed in conjunction with the Committee on Economics, other departments and institutions of the Government of the Sverdlovsk Region, representatives of the scientific community and public organizations, with active participation of the Governor Administration of the Sverdlovsk Region.

The technique of the quality of life evaluation was based on the account of federal and regional regulations. The procedure for the development, implementation, and evaluation of the Russian Federation government programs was approved by the Government of the Russian Federation (the Decree 588 dated August 2, 2010). The methodical guidelines for these programs development and implementation — by the Decree of the Ministry of Economic Development of Russia No. 670 dated December 22, 2010. At the regional level, the Strategy of Social and Economic Development of the Sverdlovsk Region until 2020 and the departmental programs implemented in various areas of life in the region were taken into account.

The generalization and systematization of the available experience in such techniques development in the Sverdlovsk Region and in other constituent entities of Russian Federation (the Stavropol Territory, the Krasnoyarsk Territory, the Chelyabinsk Region), as well as in some municipal formations of the Russian Federation were performed to create this technique.

The methodological tools shall comply with the following criteria:

- achievement of the goal and objectives for each area of the Program implementation should be characterized by specific indicators strictly linked to specific activities within this area;
- indicators should properly reflect the processes in the area of standard and quality of life; be accessible and verifiable, have a high elasticity to implemented measures providing subsequent evaluation of changes over specified period;
- applied methods of calculation should be simple and accessible while also should properly reflect the occurring processes.

The quality of life of the Sverdlovsk Region population was analyzed by 12 categories (Table 1).

The methodological tools of evaluation of the quality of life of the population in the region comprise:

- a) Integrated objective evaluation (*QLP*) — quantitative indicators grouped by key categories;

Categories and statistical indicators of the evaluation of the quality of life of the population

Category of evaluation	Evaluation indicators
Development of civil society	Sociological evaluation only
Demographic potential of the region	Average annual number of population, rate of natural increase, net migration rate
Health protection and promotion	Population mortality, infant mortality, medical service density, disease incidence, number of disabled people
Improvement of accessibility and quality of education	Preschool education coverage, the number of university students
Comfortable social environment; development of the housing sector and improvement of the quality of service in the area of housing and utilities	Volume of housing construction, level of housing provision, ratio of old and substandard housing in the total area of housing, the share of household expenditures on housing and utility payments to the total amount of consumer expenditures
Improvement of accessibility of the cultural environment and satisfaction of the population needs in free cultural and creative self-realization	Newspapers, the number of theater spectators, visits to museums
Population well-being improvement	Average population income, general unemployment level (according to the ILO), the Gini coefficient, the ratio of per capita income to the minimum subsistence level, the share of population with incomes below the subsistence minimum
Improvement of accessibility and quality of transport services for population, and road safety	Passenger turnover of bus transport, freight turnover of motor transport, density of public roads with hard surface
Development of goods and services market	Retail turnover per capita, volume of paid services per capita
Formation of comfortable, environmentally safe living environment	Air pollutant emissions from stationary sources, discharge of polluted wastewater into surface water bodies, the area of woodlands and plants in cities of the region
Ensuring the safety of population life activity	Number of registered crimes
Economic potential of the region	Gross Regional Product (GRP) per capita, the number of small and medium business entities, investment in fixed capital per capita

b) Integrated subjective evaluation (*SI*) – satisfaction of the population with accessibility and quality of services, the state of the living environment, and the evaluation of the population well-being based on results of the online survey.

Objective (statistical) evaluation of the quality of life of the population (*QLP*) is based on the statistical indicators provided by the Federal State Statistics Service that are freely available. Since particular indicators used to build the *QLP* index are measured in different units, they were brought to the comparable mean using the normalization method. Herewith, it was assumed that zero value of the converted indicator corresponds to the lowest quality of the present property during the analyzed period while the maximum value – to the highest one. Particular choice of the unified conversion depends on to what type the analyzed indicator belongs:

a) if a particular indicator is linked to the quality of life of the population by steadily increasing dependency, the converted  $X^*$  index is calculated by the formula:

$$X^* = \frac{x - x_{\min}}{x_{\max} - x_{\min}}, \quad (1)$$

where  $x$  is the current value of the converted index;  $x_{\min}$ ,  $x_{\max}$  are respectively the worst and the best value of the converted index occurring during the analyzed period.

b) if a particular indicator is linked to the quality of life of the population by steadily decreasing dependency, the converted  $X^*$  index is calculated by the formula:

$$X^* = \frac{x_{\max} - x}{x_{\max} - x_{\min}}, \quad (2)$$

where  $x$  is the current value of the converted index;  $x_{\min}$ ,  $x_{\max}$  are respectively the worst and the best value of the converted index occurring during the analyzed period.

The synthetic index of the quality of life of the population for each block of the quality of life ( $QLP^*$ ) is calculated as the arithmetic average of the converted indices that are included in its structure:

$$QLP_i^* = \frac{\sum X_i^*}{n}, \quad (3)$$

where  $X_i^*$  are converted indices of indicators comprising the synthetic index;  $n$  is the number of indicators comprising the synthetic index.

Quality of Life Index ( $QLP$ ) is calculated as the arithmetic average of the synthetic indices<sup>2</sup>:

$$QLP = \frac{\sum QLP_i^*}{m}, \quad (4)$$

where  $m$  is the number of synthetic indices of the quality of life of the population.

Subjective evaluation of the quality of life of the population ( $SI$ ) was based on results of the online survey of the Sverdlovsk Region population (October 2013). 2,034 people participated in the survey, women (85 %) were the most active part of the population that participated in the survey; the age structure of the respondents is as follows:

Under 20 years of age	21–30 years	31–40 years	41–50 years	51–60 years	Over 60 years
28 (1.4 %)	226 (11.1 %)	701 (34.5 %)	611 (30.0 %)	452 (22.2 %)	16 (0.8 %)

The questions in the questionnaire were asked by the same categories on which the collection of statistical data was performed. The questionnaire was posted on the websites of the Governor's Administration and of the Ministry of Economy of the Sverdlovsk Region.

Each item in the questionnaire was evaluated using the 5-point rating scale, where 1 – absolutely not satisfied; 5 – completely satisfied. The level of satisfaction for each item was determined as weighted average score:

$$Y_j = 5y_1 + 4y_2 + 3y_3 + 2y_4 + y_5, \quad (5)$$

where  $Y_j$  is the satisfaction index for a particular item;  $y_1, y_2, y_3, y_4, y_5$  – the proportions of respondents who rated the specific item with 5, 4, 3, 2 and 1 scores respectively.

The synthetic population satisfaction index on each block ( $SI^*$ ) is calculated as the arithmetic average of particular indices:

$$SI_j^* = \frac{\sum Y_j}{k}, \quad (6)$$

where  $k$  is the number of indicators included in the synthetic index of satisfaction / well-being.

The index of population satisfaction with living conditions is calculated as the arithmetic average of synthetic indices:

$$SI = \frac{\sum SI_j^*}{p}, \quad (7)$$

where  $p$  is the number of synthetic population satisfaction indices.

Integrated evaluation of quality of life of the population ( $IQLP$ ) is calculated as weighted mean of objective and subjective<sup>3</sup> evaluations:

$$IQLP = 0.8 \times QLP + 0.2 \times SI \quad (8)$$

<sup>2</sup> Since in the course of results verification the average weighted score practically did not differ from the arithmetic average, the second option was further selected to simplify calculations in this case.

<sup>3</sup> For correct calculation of IPQL, the Satisfaction Index (SI) scoring was converted into the fractional value by dividing the obtained value of SI by 5, i.e. the highest possible score.

## Results

The objective component evaluation of the quality of life of the population of the Sverdlovsk Region was based on statistical data of the Federal State Statistics Service (of its territorial body in the Sverdlovsk Region). The indicators for measuring the level of development of civil society were not found among the available statistical data. Therefore the evaluation of the quality of life in this area was not performed.

The period from 2000 to 2013 was chosen for the analysis of statistical information, the initial stage of which was characterized by relative stabilization of social and economic situation in the country and more or less constant rate of economic growth. The choosing the sufficiently long period provided the analysis of changes that happened in the quality of life of the population indices of the Sverdlovsk Region, which indicates decline in the level of safety of life activity, in the quality of services in the area of housing and public utilities, as well as in the demographic potential of the region (Fig. 1).

In the meantime, the indicators characterizing the remaining categories of the quality of life evaluation have positive dynamics that was reflected in the significant increase in the values of synthetic indices.

In general, according to statistics evidence, the quality of life of the population of the Sverdlovsk Region is growing steadily consistent with the overall economic dynamics. For example, the global

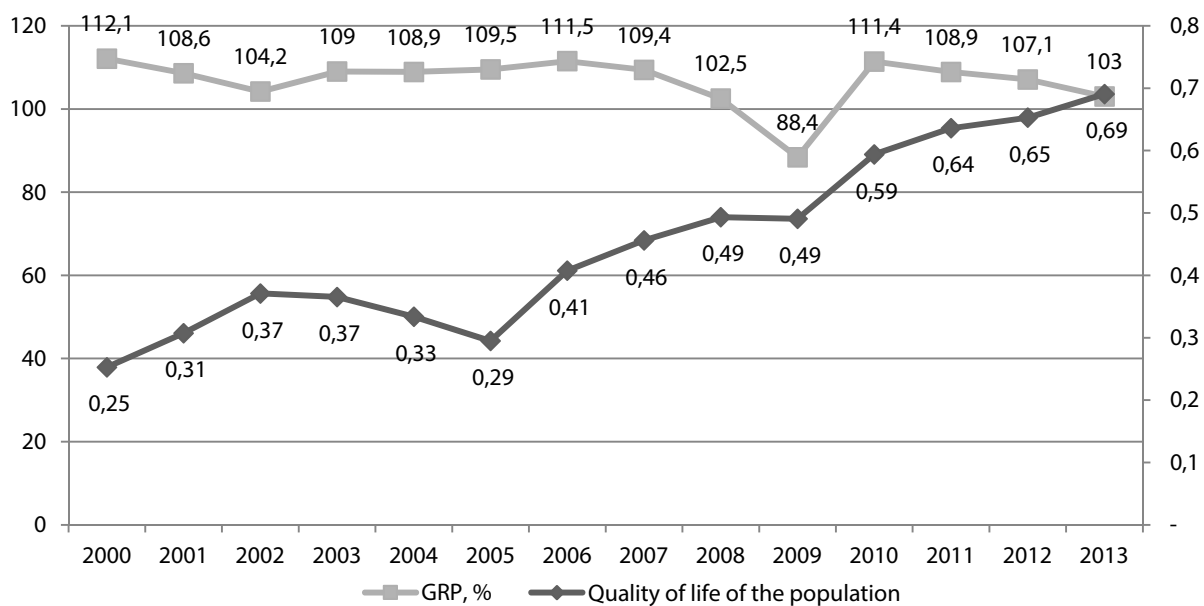


**Fig. 1.** Values of the synthetic indices of the objective evaluation of the quality of life of the population of the Sverdlovsk Region in 2000 and 2013

financial crisis in 2008 manifested itself not only in the economic development reduction in 2009, and in the deterioration of the quality of life of the population (Fig. 2) as well.

This integrated index clearly reflects the impact not only of economic factors but social ones too. For example, in 2005, the significant decline in living standards was recorded, which was due to the combined effects of certain social factors.

Therefore, according to the data of the Federal State Statistics Service, in 2005 (against the previous year) in the Sverdlovsk Region the sharp increase in the disease incidence (by 4.2 %) took place; the



**Fig. 2.** Dynamics of GRP and the quality of life of the population index of the Sverdlovsk Region in 2000–2013

share of the population expenditures for housing and utilities services payment (by 15 %) significantly increased. At the meantime, the Gini coefficient increased by 2.2 % indicating differences in income growth of the population; the criminality substantially increased in the region (by 30 %), which was ultimately reflected in the quality of life index.

In addition, using the method of correlation analysis, the effect of individual factors was evaluated on the formation of the total *QLP* index. The impact was assessed by the significance of the explained dispersion index of one or another category of the evaluation of *QLP* index. Further, these indices were normalized and evaluated in the order of their significance. Therefore, the objective evaluation of the population well-being by one or another indicator was obtained characterizing the category of the quality of life evaluation.

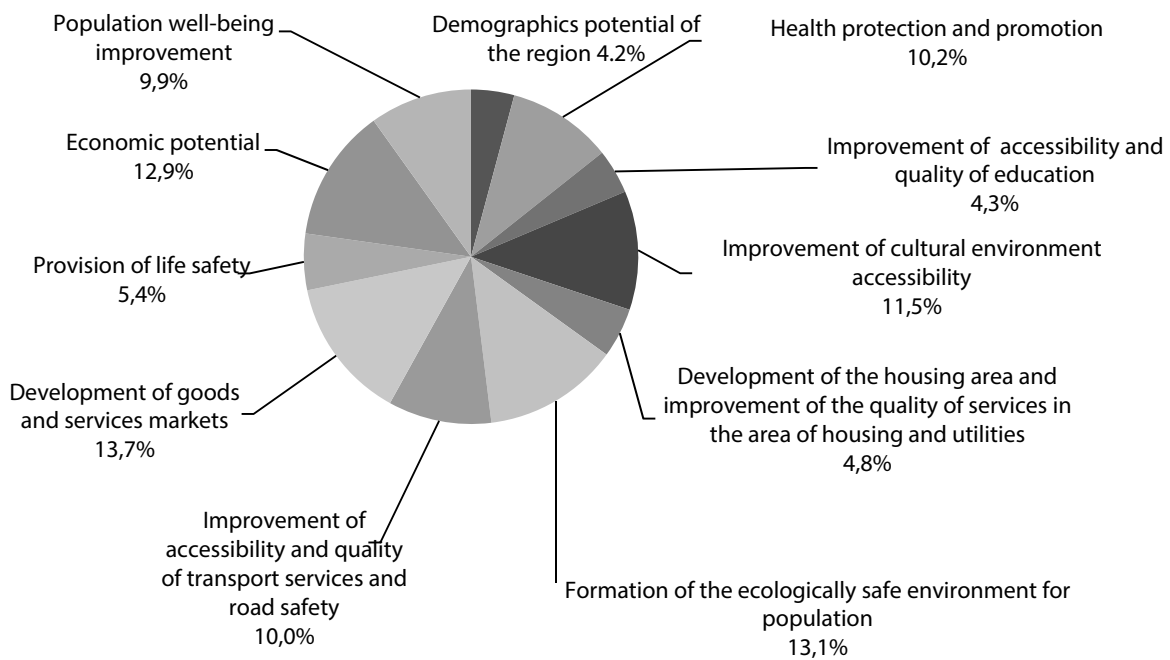
As we can see from the impact evaluation, people assign the most important significance to the consumer market development and the state of the environment. The proportion of these components is approximately equal and is estimated at the level of 14–13 % (ref. Fig. 3). The economic potential of the region was equally important in the formation of the quality of life of the population, which is crucial for other factors affecting the population standard of living in the region. As the analysis showed, the smallest contribution to the *QLP* index evaluation was made by components of demographic potential in the region and by the accessibility of education quality, which may indicate the decrease of significance of these problems perception by population at the present time.

Subjective evaluation of the population well-being relatively to the quality of life indicators showed a slightly different result than the objective assessment. So, the summary index reflecting the population well-being in terms of the quality of life was below “satisfactory”. And the lowest rate of the population satisfaction was noted for the housing sector and the environmental situation in the region (Fig. 4).

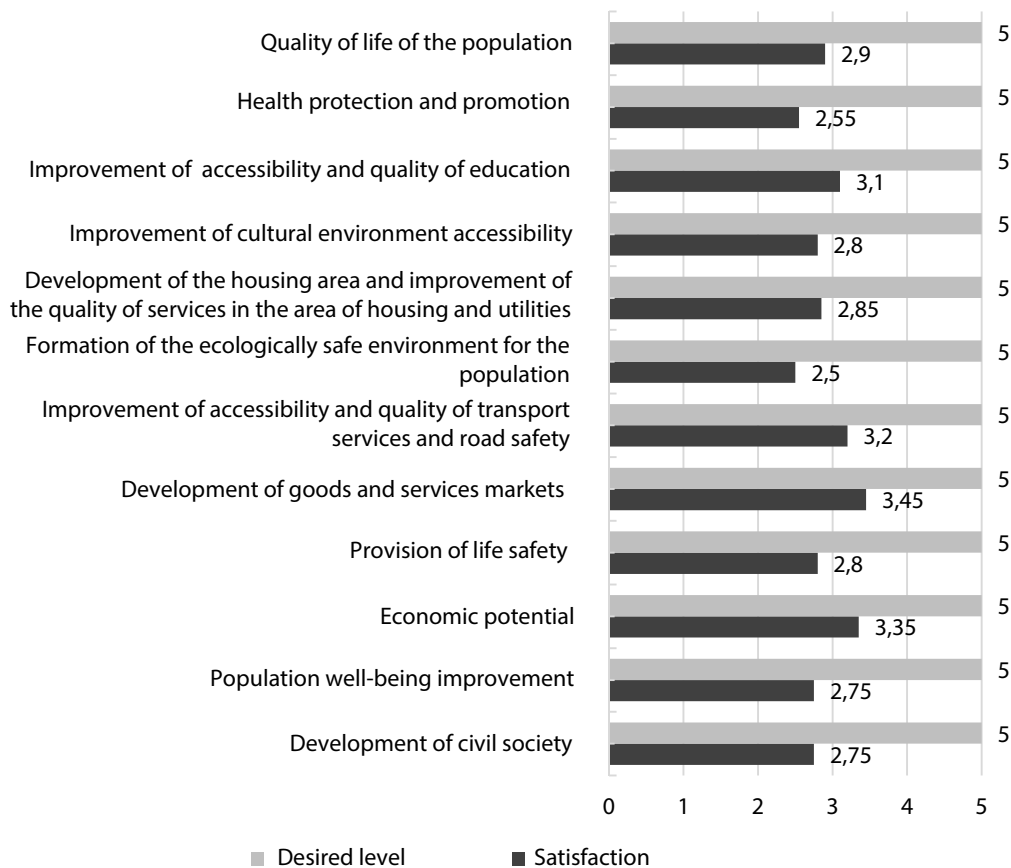
Such a low level of public satisfaction deteriorates the integrated index of quality of life of the population to 0.68. In other words, the aggregate index of the quality of life of the population in the Sverdlovsk Region is 61 % out of possible 100 %. Therefore, despite of the positive dynamics of quality of life of the population indicators, when developing the regional social policy, the attention should be paid not only to the improvement of the objective social and economic indicators, but also to the social well-being of residents of the region.

## Discussion

As the analysis of statistical data evidence, the objective evaluation provides for the evaluation of the economic factors impact on the quality of life. Therefore, if at the beginning of the analyzed period the significant gap and outrunning growth of the region-formed income over the quality of life were revealed, in the subsequent period the rapprochement of the dynamics of these two indicators took place.



**Fig. 3.** Contribution of the quality of life indicators to integrated IQLP, %



**Fig. 4.** Results of the quality of life survey in the Sverdlovsk Region in 2013 (Questions about the demographic potential of the region have not been asked)

Additional subjective evaluation of the quality of life of the population in the region provides for the adjustment of the integrated index value and consideration of the social well-being of the population. Some decrease in *IQLP* in the Sverdlovsk Region takes place due to unsatisfactory evaluations that the population of the region demonstrated in the results of the survey.

Therefore, if these two approaches are used for the quality of life of the population evaluation in the Sverdlovsk Region, the problems in the region can be seen. If the objective assessment shows

**Objective, subjective and integrated evaluation of the quality of life of the population in the Sverdlovsk Region in 2013**

Category of evaluation	<i>QLP</i>	<i>SI</i>	<i>IQLP</i>
Development of civil society	—	0.55	0.11
Population well-being improvement	0.65	0.55	0.63
Economic potential	1.00	0.67	0.93
Provision of life safety	1.00	0.56	0.91
Development of goods and services markets	1.00	0.69	0.94
Improvement of accessibility and quality of transport services and road safety	0.50	0.64	0.53
Formation of the ecologically safe environment for the population	0.64	0.50	0.61
Development of the housing area and improvement of the quality of services in the area of housing and utilities	0.43	0.57	0.45
Improvement of cultural environment accessibility	1.00	0.56	0.91
Improvement of accessibility and quality of education	0.64	0.62	0.63
Health protection and promotion	0.68	0.51	0.64
Demographic potential of the region	0.53	—	0.42
Quality of life of the population	0.71	0.58	0.68

the relatively small contribution of an indicator, and therefore it has less significant impact on the integrated index, while in the subjective evaluation the same indicator was considered by the population as unsatisfactory, the created gap must be eliminated (Table 2). For example, the indicator “safety provision” has the integrated *IQLP* small contribution — just over 5 %. At the meantime, the survey showed that people do not feel safe, and, therefore, there is no satisfaction with actions of the authorities in this area. So it is a certain feedback for the authorities to increase the effectiveness of measures for improvement of the crime situation in the region.

The controversy of the indicator “leisure activities — cultural activities” should also be noted. If the objective evaluation shows its significant contribution, the population is not satisfied with this criterion of quality of life. This means that the regional authorities should focus on this index. In the event of the success of measures, it will be positively reflected in the objective evaluation, which will provide an improvement of the overall quality of life.

### Conclusion

The technique testing showed the prospects of its further improvement. For example, from the methodological point of view, the results of the population survey should serve as adjustment indices of the system of living standards indicators. According to performed calculations, the satisfaction index (*SI*) is a lowering factor, but when using it in the calculation of the integrated index of quality of life of the selected weight coefficients (0.8 and 0.2), it was weakly reflected in the dynamics of statistic indices that, in our opinion, decreased importance of the subjective evaluation. The search of the more optimum ratio of weight coefficients is required.

The technology and methodological tools of the online population survey as one of simple and accessible ways should be updated. At the meantime, the weak coverage of the rural population by such surveys is the biggest disadvantage of the approach. It is also desirable to form a more representative sampling for the survey within other social and demographic groups of the population (85 % of female respondents can give a distorted picture of the actual satisfaction with the quality of life of society, since men, most likely, have somewhat different idea of the quality of life, just as adults differ from young people).

However, the proposed methodological approach to the quality of life evaluation of the region with the availability of indices and relative simplicity of methods of their measurement is a quite effective tool to evaluate the results of the program-targeted methods of management of social and economic processes in the region.

The performed study revealed that the objective and subjective evaluations provide for the assessment of not only of the actual situation in the region, but also for the identification and evaluation

of causes that require special attention of the authorities in executive decision-making to improve the quality of life in the region.

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