

# Quality of life of the population and environmental safety: an assessment in Central Asia

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**Abstract.** Improving the quality of life of the population is among the main goals of the national policy of the countries of Central Asia. This goal is designated as a priority in the activities of the United Nations (UN) for the period up to 2030. The article considers one of the problems typical for the countries of Central Asia - improving the quality of life in the face of growing environmental problems that affect human health and changes in his environment. The quality of life of the population directly depends on economic growth, which has an impact on climate change, and as a result, negative changes in the quality of the environment. The article reveals the concept of "quality of life", and the main indicators of its assessment. The study presents the results of comparing the indicators of Central Asian countries in terms of the quality of life of the population based on methods that characterize certain aspects of socio-economic and environmental processes. An analysis is made of the dynamics of indicators for assessing the quality of life of the population, as well as the features of environmental safety.

## 1 Introduction

Central Asia is a region subject to a wide variety of environmental threats, both natural and man-made: droughts and floods, mudflows and avalanches, desertification and soil salinization, dam bursts and industrial accidents. All these problems, regardless of their scale and frequency of repetition, cause serious damage to the economies of the Central Asian countries and pose a real threat to stability in the region. In recent years, there have been scientific studies on the impact of climate change on security in the region and on the socio-economic development of countries, the risks of natural disasters in Central Asia and ways to overcome them. But another important topic is the quality of life of the population and the consequences that affect the deterioration of the environmental situation. The problem of quality of life not only affects all aspects of the life of society, but also reflects the level of socio-economic development of the country.

As the results of many domestic and foreign studies show, the level and quality of life of people around the world is gradually increasing, in parallel, there is also a reorientation of production activities, an increase in energy consumption, an increase in the consumption of

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natural resources and, as a result, an increase in waste in the human environment, with all the ensuing negative consequences for the life of all mankind.

The quality of life of the population of any territory depends not only on the human environment, but also on the degree of influence of society on it. The relationship between the population, the socio-economic development of the country and the natural environment is an interdependent process. So, on the one hand, there is a direct impact of mankind on nature through the ongoing industrialization, development and implementation of production technologies, infrastructure development, large-scale penetration of new information technologies into absolutely all spheres of human life, population growth in a number of territories. On the other hand, excessive use of limited resources, energy and fuel, leads to their depletion, and, in addition, to an increase in the concentration of carbon dioxide (greenhouse gas emissions) in the atmosphere, pollution of the sea and air, along with other planetary disturbances caused by human activity. From which it follows that the very interaction of man and society, as well as the ratio of production, economic, social, and environmental indicators in a certain territory, significantly affects the level and quality of life of its population.

Population growth leads to an aggravation of the problem of accumulation and processing of household waste in the Central Asian region. Open dumping of waste remains a common practice, and legal landfills do not always comply with sanitary, epidemiological and environmental standards. In Uzbekistan, many landfills do not have a protective coating to prevent the penetration of pollutants into groundwater. In addition, waste recycling remains very limited - only 2% in Kazakhstan, less than 10% in Kyrgyzstan and Uzbekistan, and 1% in Tajikistan and Turkmenistan. Therefore, a significant part of the waste remains untreated. In Kazakhstan, only 12 to 15% of waste is recycled, while in Central Europe this figure is about 30%. Many rural residents do not yet have access to established waste collection systems, resulting in significant illegal landfills that pollute the environment. In Kyrgyzstan, only 107 out of 406 identified landfills operate legally.

All countries of Central Asia have signed global climate agreements, such as the 21st Conference of the Parties to the UN Framework Convention on Climate Change (COP21), the 2030 Agenda for Sustainable Development. Of course, the countries of the region are at different stages of development and face heterogeneous effects of climate change, which also affects the quality of life. In this context, all countries identify suitable adaptation and mitigation strategies at the national level, but with different levels of progress in implementation.

## **2 Materials and methods**

When conducting a scientific study, statistical and economic methods were used. The use of comparative analysis made it possible to assess the quality of life of the population, taking into account the impact on the environment in the countries of Central Asia. Analytical methods were used when considering the features of the impact of climate change on the quality of life of the population in the countries under consideration. The abstract-logical method was applied in identifying problems, improving the quality of life of the population, as well as the impact on environmental safety.

## **3 Results**

Today, the anthropogenic pressure on the natural environment has increased many times over due to the steady increase in the population, and the effects of global climate change caused by an increase in world temperature have become more noticeable in everyday life. Thus, the

increase in the average annual temperature over the past 30 years has averaged 0.5 °C in Central Asia for every 10 years. At the same time, the population of the five countries of the region in the aggregate over the past 50 years has increased by 2-3 times and continues to grow, which leads to an increase in the anthropogenic load on the environment.

Natural and climatic features leave an imprint on the socio-economic development of the countries of the region, giving rise to a number of specific risks. Thus, according to the World Bank, the average population density was 39.0 people per 1 sq. km. km, which is 1.5 times lower than the world average for this indicator. However, at the same time, the population is distributed extremely unevenly over the territory of the countries, vast territories are practically uninhabited and unsuitable for human life (highlands, mountain gorges, deserts). This population distribution makes densely populated areas particularly vulnerable to natural disasters and man-made disasters, and also significantly limits the choice of possible areas for comfortable living.

Solving the problem of the negative impact of urban activities, emissions of greenhouse gases, chemicals, reducing the circulation of waste products of combustion in the environment and harmful to human health, countering the threat posed by climate change and environmental degradation are currently among the priorities considered by the UN in active intergovernmental cooperation of member countries. Thus, in 2015, the UN General Assembly adopted a document reflecting 17 sustainable development goals aimed at improving prosperity and protecting the planet. The 2030 Agenda for Sustainable Development was launched in 2015 with the aim of ending poverty and setting the world on a path of peace, prosperity and opportunity for all on a healthy planet [1].

Unfavorable changes in the environment affect the living and working conditions of the rural population to a greater extent than the urban population, therefore, as the climate changes and the environmental situation deteriorates, processes in rural areas will intensify first of all. In general, the countries of Central Asia are distinguished by a relatively low (below the world average) level of urbanization. In Tajikistan, the share of the rural population (72.9%) and those employed in agriculture (50.8%) is especially high. In Kyrgyzstan, more than half of the total population (63.7%) also lives in rural areas, but the level of employment in the agricultural sector is relatively low (26.3%). In Turkmenistan and Uzbekistan, about half of the total population is concentrated in rural areas (48.4% and 49.5%, respectively), in Kazakhstan - 42.6%, but only 14.9% of the population is engaged in agriculture and cattle breeding.

The quality of ecology is of great importance for the quality of life of people. The very concept of "quality of life" involves the description and evaluation of the living conditions of people living in a particular area. We are talking about conditions external to the individual and society - exogenous, but it is their impact that has an impact on the further material well-being and health of the population.

The concept of quality of life is often found in the scientific literature. "Quality of life" defines various (economic, social, environmental) conditions of life and people's ability to enjoy the social benefits that society itself creates, respectively, is broader in its semantic and meaningful meanings [2].

Widespread in the domestic literature is such a definition, where the quality of life is considered as a generalizing socio-economic category, which includes not only the level of consumption of material goods and services, but also the satisfaction of spiritual needs, the state of health, life expectancy of the population, the conditions of the human environment, moral and psychological climate.

The variety of definitions of the quality of life is accompanied by a considerable number of approaches to its description, and indicators for evaluation. At the national level, among the main indicators used to assess the quality of life of the population, it should be noted: income of the population; the subsistence minimum and the proportion of the population with

incomes below the subsistence level; quality of nutrition (caloric content); home comfort (compliance with social standards); quality and accessibility of health services; quality and accessibility of education; state of the environment; indicators of life expectancy; birth rates, mortality rates, etc. At present, the term "quality of life" is actively used when discussing issues of human development, identifying the level of inequality, as well as cross-country comparison of the well-being of the population.

Since 1990, the United Nations Development Program has compiled an annual report on human development. The Human Development Index (HDI). HDI is a comprehensive indicator that is often used as an assessment of the quality or standard of living in UN member countries. The HDI allows you to assess by country: health of its citizens (index of life expectancy at birth); access to education and educational level of its citizens (education index, measures the average life expectancy of school-age children and adult education); actual income of citizens (GDP per capita).

Taken together, these three components of the HDI are rated on an overall scale of 0 to 1 based on actual values and are ranked as: countries with very high HDI levels (greater than 0.9); with a high level of 0.8 to 0.9; with an average HDI level of 0.5 to 0.8; with a low level of less than 0.5.

It is important to note that the HDI research process takes into account many factors, from climate change to growing inequality [3]. Thus, from the Human Development Report 2019, it follows that many human development inequalities have increased and continue to increase. Climate change, along with other dangerous changes at the planetary level, only exacerbates them. The Human Development Report 2020 pays great attention to the issues of ecology, sustainable use of the environment and its resources, social justice and responsibility to generations [4].

According to data published in 2021, high HDI countries include: Switzerland - 0.962 (ranking 1st); in second place is Norway - 0.961; Iceland is third with 0.959; the United States at 21 rating positions with an indicator of 0.921; China is in 79th position - 0.768 with an average HDI. The index for the countries of Central Asia is presented in Table 1, for all countries the indicator has increased.

**Table 1.** HDI index for Central Asian countries.

Rank		Country	HDI	
in 2021 (report 2022)	Difference from the previous period (increase)		Index 2021 (report 2022)	Difference from the previous period (increase)
56	3	Kazakhstan	0.811	0.003
91	2	Turkmenistan	0.745	0.004
101	6	Uzbekistan	0.727	0.006
118	3	Kyrgyzstan	0.692	0.003
122	4	Tajikistan	0.685	0.021

Modern research shows that the factor that determines a country's specific place in the HDI ranking is the type of energy (fuel) - commercial or traditional. Thus, the countries with the highest HDI use commercial energy, while the countries with the lowest HDI consume conventional fuels. Moreover, countries with higher levels of human development tend to emit more CO<sub>2</sub> emissions per capita and tend to have more severe environmental problems [5].

Thus, CO<sub>2</sub> emissions (metric tons per capita) in 2021 in Norway - 7.7, Ireland - 7.11, Switzerland - 4.0, in the USA - 14.24, China - 8.73. In the countries of Central Asia, CO<sub>2</sub> emissions are: Kazakhstan - 11.14; Turkmenistan - 13.62; Uzbekistan - 3.73; Kyrgyzstan - 1.69; Tajikistan - 1.05.

According to the UNDP, the average life expectancy in the world in 2015 was 68.35 years, in 2019 - 72 years. The health of the population is a characteristic that differs significantly from country to country. The health of the nation and the well-being of the inhabitants of the country is characterized by the indicator life expectancy at birth, measured by the number of years that a person from the generation born at birth would have to live on average, provided that throughout the life of this generation, age-related mortality remains at the level of a year, for which it was designed.

Factors that shape life expectancy include health outcomes, access to health services, employment and income, food quality, environmental conditions, and others. Trends in mortality rates by age can also provide important data on why and where new deaths occur. diseases and what kind of adverse factors affect this process.

Another international method used to compare the well-being of the population in different countries is the Quality-of-Life Index developed by the OECD (Better Life Index). The index includes an assessment of 11 indicators that stand out as the most important in the field of the quality of life of the population: housing conditions; income; work (employment and unemployment); education; society; ecology; civic engagement; healthcare.

Evaluating the environmental indicators conducted by the OECD (Better Life Index), we see countries that maintain a high level of environmental protection in their development and vice versa. The country with the highest content of suspended particles PM 2.5 in the air is Korea, where it is 27.9 micrograms per cubic meter.

The environmental situation in Central Asia carries numerous risks for the population and economy of the countries of the region, and their adaptive capacity to counter these risks is low [6]. In the climate change vulnerability rating compiled by the World Bank, Tajikistan ranks first among all countries in Eastern Europe and Central Asia, Kyrgyzstan is in third place, Uzbekistan is sixth, and Turkmenistan is seventh. In the countries of Central Asia, the sensitivity of socio-economic processes and infrastructure to the impact of climate change is strong [7]. The countries of the Central Asian region are characterized by low adaptability to the negative effects of climate change due to the low level of economic development and the welfare of the population, as well as social instability, the lack of a set of measures and the interaction of special structures to combat climate change [8].

Since 2006, the British analytical center has been conducting a rating - The Legatum Prosperity Index - an indicator that measures the achievements of countries in terms of their well-being, reflecting such parameters of public welfare as: economy; entrepreneurship; education; healthcare; safety; social capital; ecology. Table 2 shows the rating position of countries, including Central Asia, "The Legatum Prosperity Index".

**Table 2.** Ranking of countries according to the Prosperity Index of the Legatum Institute.

Classifier	Country	Classifier	Country	Classifier	Country
2019		2020		2021	
1	Norway	1	Denmark	1	Denmark
2	Denmark	2	Norway	2	Norway
66	Kazakhstan	62	Kazakhstan	64	Kazakhstan
113	Turkmenistan	109	Turkmenistan	108	Turkmenistan
110	Tajikistan	112	Tajikistan	110	Tajikistan
102	Uzbekistan	97	Uzbekistan	100	Uzbekistan
89	Kyrgyzstan	90	Kyrgyzstan	90	Kyrgyzstan

The ranking of each country is compiled by calculating the weighted average of all indicators. Of the 167 countries analyzed for this rating, the positions of the countries of Central Asia are not stable enough, unlike a number of other countries.

Despite the importance of ensuring sustainable growth in the material well-being of the world's population, large-scale environmental consequences, resource depletion, waste of

water resources, global warming and their impact on the quality of life of mankind are coming to the fore today [9].

Most often, when analyzing the quality of life of the population, generalizing indicators are used that allow comparing territories in terms of the level of socio-economic development, including the environmental aspect. Significant difficulties are presented by the calculation of indicators of the quality of life in areas with significant differences in the regions in terms of natural-climatic and socio-economic conditions [10].

Responding to climate and environmental change is not only about how effectively different government structures work together and develop sound legal and economic policies, but also how effectively they interact with global, regional development and financial stakeholders [11]. This reflection could also provide a more objective and evidence-based assessment of governance in the region, as it would allow for an assessment of how financial resources allocated through various funds are rationally channeled towards climate change. Therefore, this may provide the countries of Central Asia with opportunities to further expand their efforts to address climate change by mobilizing untapped funds, expertise and technology [12].

Lack of coordination or limited interagency cooperation within the government structure can greatly undermine the practical application of laws and policy responses. Therefore, it is of great importance to analyze and understand how policy coordination models are coherent. The SDGs provide an assessment of policy coherence in Central Asia, which can serve as promising entry points for changing or improving country governance and legislation. Climate policy interactions affect many other sectors, including water, energy, food, etc. [13]. Although this is only a top-down part of government decision-making. To have the most comprehensive political mechanism at hand, there must be clear communication in both the vertical and horizontal dimensions of governance. Ultimately, a broader understanding of the ways to involve the private sector and the population in the decision-making process on national climate policy is essential [14]. This, in turn, can ensure the complexity of the policy being developed and affect the indicators of the quality of life of the population.

## **4 Conclusions**

Thus, over the years, several approaches and methodologies have been developed to measure and monitor countries that highlight different aspects of well-being and quality of life. There are objective differences between the currently existing methods and indices of well-being and quality of life: in terms of the choice of measurements and variables, in terms of data collection, in terms of research objectives. This is largely due to the existing diversity of ideas about the quality of life. So, some of them include, in addition to the material aspects of well-being, non-material aspects, in addition, they may also include aspects of the life situation, social relations, environmental quality, etc. The data underlying most measurements mainly come from official sources such as the OECD or National reports, UN statistics, World Bank statistics, national statistical databases [15, 16].

The analysis carried out made it possible to identify the main drawback of most methods and approaches to measuring the quality of life - the lack of causal relationships of indicators. Thus, some link economic growth and welfare development, others link economic growth with harmful effects on the environment, others link the quality of life with such variables as work quality, health, work safety, while not substantiating their relationship and mutual influence [17, 18].

The impact of ecology on the quality of life and vice versa, improving the quality of life of the population that has a negative impact on the environment requires the implementation of measures, programs that would evaluate changes and inform society about the results. In particular, it is necessary to update programs for adaptation to climate change, which requires

concerted efforts through intersectoral coordination mechanisms both at the national and regional levels. A comprehensive review of national climate change research reports indicates that some geographic sub-regions may be particularly affected by population movements/movements and quality of life. Governments can use this information to make informed decisions as a matter of priority for funding and developing national programs.

Without adaptation measures, high economic costs are inevitable. First, large investment costs will be required to scale up adaptation measures over large areas. Second, some adaptation measures will need to be carefully implemented in order not to compromise sustainability in the long term. Thirdly, it is necessary to realistically assess the time horizon for the dissemination of these measures across the countries of Central Asia. It usually takes several years and decades for the implementation to cover large areas.

In addition to finding new technical solutions, integrated planning and cross-sector collaboration is needed to exploit possible synergies for cost reduction, trade-offs, demand-side intervention and decentralized services to ensure infrastructure sustainability. It is necessary to create intersectoral coordinating institutions and structures that will implement measures to improve the quality of life of the population of the Central Asian countries through adaptation to climate change.

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