

Statistical Study of Demographic Processes in The Republic of Uzbekistan

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Abstract. This article proposes the procedure for statistical assessment and forecasting of demographic development, provides feedback on the assessment of demographic development, assesses the state of demographic development of the Republic of Uzbekistan, provides scientific proposals and recommendations to ensure demographic development.

Keywords: Assessment, demographic indicators, demographic threats, demographic development, pre-crisis, crisis, forecasting.

I. INTRODUCTION

Unprecedented demographic changes in the world, such as population growth and mobility, the level of urbanization and the growing share of the elderly, are threatening economic security. According to the United Nations, by 2020 the world's population will reach 7.8 billion. and will continue to grow steadily until 2050, reaching 9.7 billion. per capita, is expected to reach about 11.0 billion by the end of the century [1]. In this regard, the states are taking targeted measures to eliminate threats to demographic development.

Extensive research is being conducted to reduce economic security around the world. In this regard, it is especially important to stimulate the national economy, strengthen cybersecurity, develop mutually beneficial economic relations, efficient use of resources, develop the intellectual base, improve and innovate infrastructure, increase economic activity, create a stable social environment. It should be noted that the issues of demographic development play an important role in the structure of scientific research.

Achieving domestic economic stability and strengthening its position at the international level, state control over the movement and use of national resources, food security, adequate resource base and diversification of resources, ensuring sustainable employment and access to social security, human special attention is paid to the issues of high level of capital development. On "Ensuring macroeconomic stability" in the state program for the implementation of the "Development Strategy of New Uzbekistan for 2022-2026" in the "Year of Human Dignity and Active Neighborhood", approved by the Decree of the President of the Republic of Uzbekistan dated January 28, 2022 PF-60 [2] specific measures have been identified. In this regard, the expansion of research on the systematic analysis and forecasting of demographic processes, delimitation of risk zones in the field of demography, the organization of an effective system of demographic security, the development of a strategic concept for improving demographic development.

II. REVIEW OF THE LITERATURE ON THE SUBJECT

The need for a comprehensive approach to the study and regulation of demographic development remains important. In such an approach, demographic development is considered, on the one hand, in a complex system that determines its factors, on the other hand, in the interaction of the processes that constitute its development [3].

A number of researchers have used integrated indicators to assess the demographic situation. One of these indicators is the vitality index. Its value is found by dividing the birth rate by the number of deaths or the number of births by the number of deaths. In cases of decline in the natural population, it is usually found through the inverse division of the mortality rate [4].

Also, S. Sulakshin proposed the coefficient of vital factors of the country as an integral indicator describing the demographic situation and the success of demographic policy in general [5].

In addition, one of the few methods of determining demographic security was developed by S. Soboleva and O. Chudaeva. These authors proposed a system of indicators of demographic threats [6].

E.. Shershakova suggested an alternative methodology for assessing demographic indicators. The author presents a system of demographic indicators consisting of 11 main indicators: life expectancy at birth, natural mobility, birth rate, mortality, infant mortality, life expectancy, migration growth (decrease), aging rate, working age the economic burden of the older population, the overall unemployment rate, the poverty rate [7].

Philip Hon and Jitka Langhamrova also proposed a system of indicators that could be included in the list of social efficiency indicators to assess the effectiveness of the implementation of the mechanism of state regulation of demographic processes [8].

Summarizing the analysis, it should be noted that today there are shortcomings in a single complex approach that allows to analyze and forecast the demographic situation.

III. RESEARCH METHODOLOGY

The article used systematic analysis, absolute, relative and average quantities, grouping, complex evaluation, logical and comparative analysis, index methods.

IV. ANALYSIS AND RESULTS

One of the main methodological tools of scientific research of demographic development is the assessment of its status. Assessment of demographic development allows to determine the level of threats to the security of the region, its quantity and quality, the direction of future development of the country's economy and the formation of program-targeted measures to address these threats.

The threshold levels of indicators are of great importance for a clear goal-oriented policy of ensuring demographic development, and going beyond them significantly hinders the normal course of the production process and leads to negative trends.[11]

Determining and taking into account the threshold levels of demographic development indicators is one of the most important tasks of state regulation of the economy.

Мамлакатимиз ва хорижлик олимларнинг ишларини тадқиқ қилиш асосида биз интеграл кўрсаткични ҳисоблаш ва демографик ривожланишни баҳолашнинг қуйидаги босқичлардан иборат усулини ишлаб чиқдик (ўргандик):

1. The stage of selection and scientific substantiation of indicators for the assessment of demographic development and their threshold levels.

To assess economic security, the integral indicator can be assessed on the following indicators (Table 1).

Basically, the indicators of assessment of demographic development were proposed by foreign economists, and the author selected a system adapted to the Republic of Uzbekistan, as well as thirty-four demographic indicators in the system of economic security.

All indicators were grouped according to the following areas of analysis, which are of strategic importance for the demographic development of the region: population movement; population structure; population health; labor market and welfare.

The described system of indicators and the database of indicators are based on complex principles (covering almost all aspects of demography), scientifically based (indicators are determined based on statistics used in national and world practice), systematically (indicators are interrelated).

In the development of these indicators, the official data of the State Statistics Committee of the Republic of Uzbekistan were used and the indicators calculated in this statistical database were used.

Then, in order to assess demographic development, the threshold levels of indicators are determined based on the study of the work of foreign and domestic economists.

The boundary values are based on the average values of the Republic of Uzbekistan, adjusted by the author taking into account the impact of the demographic factor and the long-term dynamics of socio-economic development of the country.[12]

The use of this system of indicators and their threshold levels makes it possible to assess demographic security and identify high risk points in various sectors of the economy.

Table 1: The system of demographic development indicators and its threshold values by directions

Indicator	Boundary value	Indicator	Boundary value
1. Demographic potential		18. Proportion of economically active population, %	50,0
1. Average annual population growth rate, %	1,3	19. Employment rate, %	46,0
2. Proportion of persons under working age in the total population, %	22,0	20. Unemployment rate, %	8,0

3. Proportion of able-bodied people in the total population, %	58,0	21. The level of crisis in the labor market, unit	6,0
4. Aging rate of the population, %	6,0	22. Percentage of informal migrants, %	1,0
5. The number of people under the age of working age per 100 able-bodied people	40,0	23. Proportion of occupations in hazardous and unsafe working conditions, %	2,0
6. The number of able-bodied persons per 100 able-bodied people	30,0	24. Rate of injury in production, per 1000 workers	0,5
7. The number of disabled people per 100 able-bodied people	70,0	Income of the population	
8. General fertility rate, ‰	20,0	25. The growth rate of real incomes of the population, %	105,0
9. The overall mortality rate, ‰	10,0	26. The share of food consumption expenditures, %	40,0
10. Infant mortality, ‰	5,0	27. Poverty ratio, %	8,0
11. Mortality rate of the working age population, ‰	2,0	28. Fund coefficients, March	7,0
12. Natural growth rate, ‰	6,5	29. The ratio of the average amount of pension to the average amount of salary, %	40,0
13. Migration growth rate, ‰	0	Social infrastructure	
14. Total life expectancy at birth, age	72	30. Public spending on health relative to GDP, %	7,0
15. Life expectancy at birth of men, age	70	31. The number of hospital beds per 10,000 population	120,0
16. Life expectancy of women at birth, age	74	32. Provision of the population with doctors, per 10,000 population	60,0
2. Labor market		33. The population is provided with secondary medical staff, per 10,000 population	120,0
17. Share of labor resources, %		34. Level of housing, sq.m.	25,0

Source: Calculated by the author on the basis of data from the State Statistics Committee of the Republic of Uzbekistan.

It should be noted that the proposed socio-economic and demographic indicators need to be adapted to conditions that change from time to time.

The proposed indicators for assessing demographic development were mainly related to the indicators adopted in economic science, practice and statistics. In addition, the proposed evaluation indicators provide for the possibility of using them to assess the effectiveness of public administration.

2. The stage of calculation of individual indicators of the integral indicator on the quantitative assessment of demographic development.

In the next stage, the integral indicator of quantitative assessment of the level of demographic development, which is formed on the basis of individual indicators grouped by strategic directions, is calculated.

An integrated indicator of the level of economic security (Kixd), which is formed on the basis of individual indicators grouped by strategic directions, is proposed.

We propose to use a simple arithmetic average formula to combine the individual normalized data into a single integral indicator, the application of which assumes that all basic indicators are interchangeable, and the

decrease in the level of one of the normalized indicators is fully offset by another positive change (Formula 1):

$$K_{ux\partial} = \frac{\sum Ki}{n} \quad (1)$$

where: n is the number of strategic directions in the analysis of economic security.

The use of the arithmetic mean is based on a mathematical point of view, because we are considering a system of indicators that are not functionally related and have the same weight, which is determined by the choice of indicators.

It is proposed to define the level of significance for each individual indicator as the ratio between the actual and boundary levels of the indicators. This method allows the transition to a single dimensionless size, which is very important for the proposed system of indicators with different units of measurement, and the normalization with respect to the threshold level, which is accepted as a unit.

The significance (ratio) coefficient is calculated as the ratio of the actual level to the threshold level if it is expedient to increase the corresponding indicator of economic security (Ki1) and vice versa if it is expedient to reduce it (Ki2) (formulas 2 and 3):

$$Ki_1 = \frac{Yx_i}{Yu_i} \quad (2) \qquad Ki_2 = \frac{Yu_i}{Yx_i} \quad (3)$$

Where: Ki1 and Ki2 are the coefficients of the ratio between the actual and boundary levels;

Yx_i is the actual value of the indicator;

Ychi is the threshold value of the indicator.

3. The stage of assessing demographic development on the basis of a scale of criteria. The following scale of criteria for the integral indicator of the level of demographic development, developed taking into account the views of experts to assess demographic development, is proposed (Table 2).

Table 2: Demographic development assessment scale

assessment of demographic development	criterion limits of the integral indicator of demographic development
high	1.05 and higher
normal	1,00-1,04
low (crisis)	0,70-0,99
crisis	0,5-0,69
input	0.49 and below

Based on the study of the work of foreign and local economists, we have identified the following main gradations of the state of the region in terms of demographic development: high, normal, low (before the onset of the crisis), crisis and critical.

The demographic development of the region will be highly valued if the level of integral indicators in the range of 1.05 and above is provided for the whole region. This will ensure all areas of demographic development assessment and their final levels above 1.05. If at least one indicator has a level below 1.05, the overall situation in that direction or region should be considered normal.

We consider the situation where the level of the integral indicator in the range of 1.00 - 1.04 is provided in the region as a normal state of demographic development of the region. This ensures that all components of the demographic security assessment and their final levels above 1.00 are provided. If at least one indicator has a level below 1.00, then the overall situation in this direction should be considered low (crisis).

We consider the situation where the level of the integral indicator is in the range of 0.70 - 0.99 across the region as a low (pre-crisis) state of demographic development of the region. If at least one indicator has a level below 0.7, then the general situation in this direction should be considered a crisis situation.

The low (pre-crisis) state of demographic development is characterized by the fact that threats to demographic development are becoming increasingly important in management processes. If measures are not taken to address economic and social threats, there is a risk of developing destabilizing factors that could worsen the overall economic situation or weaken security in the most important areas of life support.

At the same time, there is a need to assess the situation of the subject under consideration not only in individual areas, but also in the socio-economic system as a whole. The pre-crisis situation does not mean an irreversible deterioration of the situation in general, but it may mean a significant deterioration of the situation in certain areas of life support. However, this deterioration can be remedied mainly by taking the necessary corrective measures of an organizational, managerial and financial-economic nature.

The introduction of the concept of "pre-crisis state" of demographic development is necessary to identify in a

timely manner the dangerous trends in the development of the situation and to prevent their growth. Therefore, preventive measures are mainly applied in the pre-crisis stage. However, it is impossible to ignore the severity of the pre-crisis state of economic security, as the length of exposure to negative factors gradually weakens the subject's resistance to this action, which usually leads to a further deterioration of his condition. As different sectors of life are closely interrelated, the deterioration of the situation is gradually taking over new and new sectors of the economy. The subject's ability to resist threats gradually decreases and the threat to its sustainable development increases.

In general, we consider the situation when the integral indicator for the region is in the range of 0.5 - 0.69 as a crisis of demographic development of the region. If at least one indicator has a level below 0.5, then the overall situation in this direction should be considered as a critical situation.

The crisis phase is characterized by a significant deterioration of the financial and economic situation of economic entities in conjunction with a significant deterioration of socio-demographic indicators in key areas of life support or a very significant deterioration in several key areas. As a result, the processes of reproduction in the sectors of the economy and the normal living conditions of the population of the region, the territorial structure are not provided. This stage is also characterized by very important negative trends (dynamics) of development, which threaten sustainable development in the early stages of the crisis, and lead to the loss of sustainable development as the crisis deepens.

The crisis situation implies the implementation of structural and institutional changes in the management system of the socio-economic system, in contrast to the state of demographic development before the onset of the crisis.

The transition from pre-crisis to crisis means:

- deterioration of demographic indicators in a way that affects all areas of economic activity and segments of the population and leads to a significant deterioration of financial and economic indicators;
- negative changes in the key parameters of the system (subject), leading to a weakening of the indicators of sustainable development, which is not enough to take organizational preventive measures to restore them;
- the transition to the stages of the impact of threats to development, the restoration of security, which leads to the consumption of large amounts of (material, financial) resources. In this case, the conditions for the mobilization of resources are usually out of order (lack of resources).

In general, we consider the situation where the integral indicator for the region is within the limits of 0.49 and below as a critical state of economic security of the region. The critical situation is characterized by irreversible processes in the economic and social spheres.

According to the calculations of this methodology, the index of integrated assessment of demographic development of the Republic of Uzbekistan in 2010 - 0.799, in 2015 - 0.811 and in 2020 - 0.780 (Table 3).

According to these indicators, the level of demographic development of the republic is low (pre-crisis).

The assessment revealed that the demographic factors that destabilize the pre-crisis state of demographic development in the Republic of Uzbekistan are:

- low living standards and quality of life (low health care costs, high income stratification and high unemployment);
- Ongoing deterioration of the demographic situation (high mortality rate of the working age population, lower aging of the population, etc.).

Unfortunately, the assessments showed that the indicators of the "social infrastructure" blog in the index are in a "crisis" state. This is explained by the fact that the number of hospital beds per 10,000 population is much lower than the threshold value of the number of doctors and housing.

V. CONCLUSIONS AND RECOMMENDATIONS

1. Ensuring demographic development has an important scientific and practical significance in the formation of economic sectors and regions, especially the strategy, main and priorities of future socio-economic development, taking into account the specific features and prospects of demographic development of the country.
2. Due to the rapid population growth in Uzbekistan, demographic policy should be aimed at family planning and reducing mortality. Based on this, it can be said that the demographic policy of the state is one of the means of raising living standards and reducing poverty. At the same time, the Government of the Republic of Uzbekistan should now consider family planning policy as an important factor in reducing poverty in the country, improving the health and well-being of the population.
3. As noted in the draft concept of integrated socio-economic development of the Republic of Uzbekistan until 2030, which embodies the prospects for the development of demographic processes, it

is necessary to transform the demographic factor into sustainable and balanced economic growth through the effective use of labor potential and human capital.

4. Demographic factor determines the parameters of socio-economic development in each region (province, city, district). The study identified the specific characteristics of demographic threats in each region (s) of Uzbekistan, which are formed in families and communities. Therefore, it is expedient to take into account the indicators of population, composition and location in the implementation of strategic programs of complex regional development, development of regions, cities and districts, including the forecast until 2030. In addition, regional development on the basis of demographic indicators requires the implementation of public policy by all levels of government, including employment, social protection, migration, etc. It is recommended to increase the powers and responsibilities in matters.

REFERENCES

- [1]. <https://www.un.org>.
- [2]. Decree No. PF-60 of the President of the Republic of Uzbekistan dated January 28, 2022 "Development Strategy of New Uzbekistan for 2022-2026" // National database of legal documents, January 28, 2022.
- [3]. Demography All Volumes 8 Issves. Volume 57, Issve 3, June 2020. – P.18.
- [4]. Applied mathematical demography. – 3rd ed. / Nathan Keyfitz, Hal Caswell. – New York: Springer Science+Business Media, Inc. 2014. – 575 p.
- [5]. Sulakshin S.S. Russian demographic crisis: from diagnosis to overcoming. - M.: Scientific expert, 2006. - P.26.
- [6]. Soboleva S.V., Chudaeva O.V. Demographic security of Russia and its regions: factors, problems, indicators // Region: economics and sociology. 2008. No. 3. S. 147-167.
- [7]. Shershakova E.M. Assessment of demographic security // Spatial Economics, 2008. No. 4. – P.153-165.
- [8]. Demografie, Review for Population Research – No. 2/2020. – P.71.
- [9]. Yuldashev, N., Nabokov, V., Nekrasov, K., & Tursunov, B. (2019, June). Innovative development of Uzbekistan agroindustrial complex. In International Scientific and Practical Conference “Digital agriculture-development strategy”(ISPC 2019) (pp. 334-337). Atlantis Press.
- [10]. Mustafakulov, S. I., Zarova, E. V., Tikhomirova, A. N., & Tursunov, B. O. (2019). Research of efficiency of use of production capacity at the enterprises of textile industry on the basis of methods of multivariate statistical analysis: On the example of Namangan Region of the Republic of Uzbekistan. Journal of Advanced Research in Dynamical and Control Systems, 11(7), 886-899.