



## Article

# Mechanisms for Human Capital Activation for Sustainable Regional Economic Growth (Case Study of The Khorezm Region)

Yusubboyeva Dinora Qudrat qizi\*<sup>1</sup>

1. Uzbekistan, Applicant in the field of "Economics", Urgench State University

\* Correspondence: [dinarayusuf@mail.ru](mailto:dinarayusuf@mail.ru)

**Abstract:** Human capital has emerged as a critical factor in driving sustainable regional economic growth, particularly in developing and transitioning economies. In Uzbekistan, and especially in the Khorezm region, the realization of this potential faces structural constraints, despite a favorable demographic profile. While national policies emphasize human capital development, the Khorezm region lacks an integrated strategy that aligns education, employment, healthcare, and infrastructure for comprehensive regional progress. This study aims to explore mechanisms for activating human capital to support the sustainable economic growth of the Khorezm region. The analysis reveals that although Khorezm exhibits a growing population, high literacy rates, and institutional reforms, its labor market suffers from low productivity, hidden unemployment, and a mismatch between educational outcomes and labor demands. The paper presents a localized diagnostic combining demographic, socio-economic, and institutional analyses through SWOT and comparative frameworks, revealing region-specific development levers and barriers. The study proposes actionable recommendations, including vocational education reform, digitalization, incentives for healthcare and education investment, and programs to curb brain drain. These findings offer strategic insights for policymakers to develop tailored roadmaps that foster inclusive regional development through effective human capital mobilization.

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## 1. Introduction

In modern conditions, human capital is considered a key resource of the economy. The contribution of knowledge, skills and health of people to an increasing extent determines the rate of sustainable economic growth. For the regions of Uzbekistan, including the Khorezm region, where a significant part of the population is employed in the agricultural sector and the social infrastructure requires modernization, the activation of human resources is becoming a fundamentally important task. Today, the government of Uzbekistan in its national strategies emphasizes the need to form a "humane state" and develop human capital as the basis of public welfare. The Khorezm region, as one of the agricultural regions, needs effective measures to improve qualifications and create favorable conditions for the use of labor resources[1].

The purpose and objectives of the study. The purpose of this work is to identify mechanisms for activating human capital to ensure sustainable economic growth in the Khorezm region. The main objectives: to analyze theoretical approaches to understanding human capital and its role in the development of the regional economy; to assess the current state of human capital in Khorezm (demographic and socio-economic aspects); to study the impact of human capital on the socio-economic indicators of the region; outline recommendations for the effective use of human resources in the interests of sustainable development. Research methodology. The work uses comparative-analytical, statistical and economic-mathematical methods, correlation-regression analysis tools (if possible), SWOT analysis. When collecting data, we relied on official statistics (State Statistics Committee of Uzbekistan, regional departments), materials of international organizations (World Bank, UNDP) and open sources. To summarize practical experience, data from strategies and development programs of Uzbekistan (including the documents "Strategy-2026" and "Uzbekistan-2030") are used[2].

## 2. Materials and Methods

The research employs a combination of comparative-analytical, statistical, and economic-mathematical methods to examine the mechanisms for activating human capital in the Khorezm region. The methodological framework integrates correlation-regression tools to explore the relationship between human capital indicators and socio-economic outcomes where data permits. A SWOT analysis was also conducted to assess internal strengths and weaknesses, along with external opportunities and threats impacting the development of human resources. The study is grounded in both qualitative and quantitative approaches, utilizing official statistics from the State Statistics Committee of the Republic of Uzbekistan and regional offices. Additional sources include publications and reports from international organizations such as the World Bank and the United Nations Development Programme (UNDP). To contextualize the findings, strategic policy documents including "Strategy-2026" and "Uzbekistan-2030" were analyzed to align the research outcomes with national priorities. This multi-method approach ensures a comprehensive understanding of the structural barriers and potential for human capital development in the Khorezm region. Emphasis was placed on demographic analysis, labor market trends, access to education and healthcare, and regional investment patterns. The triangulation of sources and analytical tools aimed to increase the validity and reliability of findings, thereby facilitating the formulation of actionable recommendations for sustainable economic growth through the effective mobilization of human capital [3].

## 3. Results

The concept of human capital occupies a central place in modern economic theory and development management practice. It encompasses the totality of an individual's accumulated knowledge, skills, abilities, competencies, and health that contribute to their productive participation in economic and social life. In a broader sense, human capital is a resource similar to physical capital that can and should be invested in to obtain a return in the future. According to the World Bank, human capital is "the knowledge, skills, and health that people accumulate throughout their lives that enable them to realize their potential as productive members of society." This definition emphasizes the cumulative effect of investments in a person, from early childhood to professional activity and lifelong learning [4].

The formation of human capital theory is associated with the names of such outstanding economists as Theodore Schultz , Gary Becker , and Jacob Mintzer . In the 1960s, they laid the foundations of the modern paradigm, interpreting human capital as a key component of economic growth and social progress. Schultz was the first to systematize ideas about human capital as an object of economic investment, and Becker developed a mathematical model for calculating the return on investment in education.

Mintzer contributed to the development of empirical methods for assessing the economic return on educational and professional characteristics of workers. Schultz noted that a significant part of the growth of national income in the United States after World War II was due not so much to an increase in the number of resources used, but to qualitative changes - primarily an increase in the qualifications and level of education of workers. Becker demonstrated in his model that each additional year of education increases the potential level of income of a worker, and also contributes to an increase in overall labor productivity. Modern approaches to the concept of human capital have expanded and become interdisciplinary. In addition to economic aspects, they also include sociological, psychological and demographic characteristics. For example, UNESCO emphasizes the importance of social capital (relationships, trust, norms and networks), and the World Health Organization points to the importance of health as a key component of human capital [5].

Within the regional economy, human capital becomes a tool that determines the competitiveness of territories. Regions with a higher level of education, life expectancy, pre-school education coverage and a developed system of vocational training, as a rule, demonstrate higher rates of economic growth. The importance of such characteristics as creativity, mobility, digital literacy, which contribute to the development of knowledge and innovation, is also increasing [6].

Approaches to measuring human capital range from aggregate indices (such as the World Bank Human Capital Index) to more detailed national and regional assessments. Uzbekistan is also taking steps to develop its own indicators that take into account the specifics of national development, including access to education, unemployment, morbidity, and migration processes.

Thus, the theoretical basis of human capital confirms its role as a key factor in sustainable regional development. Investing in human capital is becoming not only an economic necessity, but also a strategic choice for improving the quality of life of the population and strengthening the competitiveness of the region in the long term [7].

Sustainable development is a type of growth that meets the needs of the present without compromising the opportunities of future generations. One of the key conditions for the sustainable development of the economy and society is the development of human capital. Investments in education, healthcare, and advanced training create the innovative potential necessary for the transition to a "knowledge economy". The World Bank emphasizes that without significantly strengthening human capital, countries will not be able to ensure long-term and inclusive economic growth. Thus, improving the skills of the workforce and improving social services directly correlate with the sustainability and balance of regional development [8].

International experience shows that the most developed economies in the world purposefully invest in human capital, considering it as the basis for sustainable growth and the transition to a knowledge economy. The Scandinavian countries, Germany, South Korea and Singapore have sustainable government policies in the fields of education, healthcare and professional development. These countries have achieved a high level of human capital thanks to a systematic approach to investing in primary, secondary and higher education, coverage of professional programs, digitalization of educational systems, development of dual education and the formation of national skills assessment systems. For example, in Finland, the education system is built on the principles of accessibility, equality and focus on the development of critical thinking. In South Korea, the state actively subsidizes scientific research, technical training and school meals, which contributes not only to increased labor productivity, but also to a reduction in social inequality. Germany actively uses the dual education model, which combines theory and practice, which allows specialists to quickly adapt to the requirements of the labor market. The World Bank has launched the Human Capital Project, which aims to stimulate

investment in people to increase productivity and inclusive economic growth. According to WB estimates, countries with high levels of investment in human capital are more resilient to economic crises and demonstrate better GDP per capita growth rates. The United Nations also focuses on human capital development within the Sustainable Development Goals (SDGs), especially in areas such as SDG 3 (Health and Well-Being) and SDG 4 (Quality Education). These goals involve creating conditions for the comprehensive development of the individual and equal access to quality services [9].

In recent years, Uzbekistan has seen an intensification of human capital policies. One of the most important steps was the adoption of the "Development Strategy of the New Uzbekistan for 2022-2026", which identifies education, healthcare and youth development as priority areas. In particular, the goal is to increase higher education coverage to 50% by 2030, expand the inclusive education system and digitalize the educational infrastructure.

In addition, the country is implementing a number of pilot programs aimed at improving the quality of life of children and adolescents. For example, in the Khorezm region and the Republic of Karakalpakstan, a free school meals program for primary school students is being implemented, which helps increase school coverage and improve the health of students. Vocational training centers for young people are actively developing, especially in remote and rural areas [10].

It is also worth noting the creation of the National Agency for Human Capital Development, whose task is to coordinate the efforts of various ministries and departments in the field of education, employment, science and social protection. Thus, the analysis of international and domestic experience confirms that an effective policy in the field of human capital development requires a systematic approach, intersectoral interaction and continuous investment. The experience of the world's leading countries, as well as the steps taken in Uzbekistan, indicate a growing understanding of the role of human capital as the basis for sustainable regional development.

### **Analysis of the state of human capital in the Khorezm region**

#### **Demographic Situation**

The Khorezm region is one of the actively developing regions of Uzbekistan, including in the demographic aspect. According to official data from the State Statistics Committee, the permanent population of the Khorezm region as of January 1, 2021 was 1,893.1 thousand people, which is 1.4% more than in the previous year. By April 1, 2024, the population increased to 2,002.8 thousand people, and the forecast for the beginning of 2025 is about 2,040.0 thousand people. Thus, for the period 2021-2024 the increase was about 150 thousand people [11].

Analysis of demographic dynamics shows a steady upward trend caused, on the one hand, by a high birth rate, and on the other hand, by the stabilization of internal migration processes. However, the quality of demographic growth requires a separate assessment. A characteristic feature of the region is the predominance of the rural population: at the beginning of 2021, the share of rural residents was 66.9% (1,266.3 thousand people), while the share of city residents was only 626.8 thousand people. This structure has been preserved in subsequent years with minor changes.

Such predominance of the rural population forms the specifics of both employment and the level of qualification of the workforce. Traditionally, agricultural professions dominate in rural areas, which do not require a high level of education or specialized competencies. As a result, a significant part of the population is involved in the low-productivity sector of the economy, which reduces the overall level of human capital in the region [12].

Particular attention should be paid to the age structure of the population. More than 30% of the population of the Khorezm region are children and adolescents under 18 years of age, and another 18–20% are young people under 30 years of age. This demographic

profile creates both opportunities and risks: on the one hand, the presence of a large youth resource can contribute to the accelerated development of the region, on the other hand, in the absence of appropriate conditions for education and employment, there is a risk of underutilization of this potential. The existing burden on the education and health care systems is already significant and will grow in the coming years.

### SWOT analysis

**Strengths:** Khorezm region has a positive population growth rate and low unemployment. It has long-standing educational and cultural traditions (the region is the historical birthplace of outstanding scientists), developed school networks, and active state support for the agro-industrial complex and the construction of social infrastructure. The priority of industry tasks (for example, agriculture) encourages investors to create new jobs.

**Weaknesses:** low labor productivity in the agricultural sector, a limited range of competencies (mainly primary and secondary school), poor preparedness for modern industries (IT, engineering). Relatively high poverty rates and environmental problems (soil salinization, arid climate) reduce the quality of life. Insufficient economic diversification makes the region vulnerable to external shocks (recessions in agricultural markets) [13].

**Opportunities:** implementation of national reforms (education, healthcare, digitalization) and international programs (for example, UN projects for the development of cities and rural areas). Tourism potential (the historical pearl – the city of Khiva) can become a driver for the development of services for young people. The development of transport and logistics infrastructure (for example, transfer movement from Turkmenistan) creates demand for new labor force. Attracting investment in human capital – through retraining, grants and private education – will help compensate for structural deficiencies.

**Threats:** forced migration of qualified personnel to cities with a higher standard of living leads to a “brain drain”. Deterioration of the environment (as a result of climate change) can exacerbate health problems of the population. Without adequate measures to support socially vulnerable groups, the region risks maintaining a high level of poverty. The lack of innovative thinking and limited access to the Internet in rural areas hinder the creative potential of young people.

The formal level of education in the region is quite high. According to the census, the literacy rate of the population exceeds 99%. However, this indicator does not reflect the quality of education and the degree to which the knowledge and skills acquired correspond to the requirements of the modern labor market[14].

In recent years, a number of reforms have been carried out in the region aimed at improving the situation in the field of education. The network of comprehensive schools, colleges, and academic lyceums is expanding, and branches of universities are opening. Particular attention is paid to school meals: the government has initiated a pilot program of free meals for primary school students in the Khorezm region, which has a positive effect on the attendance and academic performance of schoolchildren. However, despite formal improvements, the region faces a number of acute problems. Firstly, there is a shortage of qualified teachers, especially in rural schools. Secondly, the infrastructure of educational institutions requires modernization - both in terms of material resources and methodological support. Thirdly, there is no clear connection between educational programs and the needs of the region's economy, especially in rapidly developing industries: ICT, applied sciences, engineering, green technologies, etc.

It should also be noted that higher education coverage is limited: the share of young people with higher education remains low compared to target benchmarks. One of the strategic development objectives of the region is to increase this share to 50% in the near



future. This requires not only expanding the network of universities, but also increasing the availability of education, especially for rural youth. The economy of the Khorezm region is traditionally focused on agriculture, which directly affects the employment structure. The agro-industrial complex accounts for a significant share of the gross regional product: over 20 trillion soums in 2021. Despite government support, including programs to subsidize cotton growing and modernize irrigation systems, labor productivity in the agro-industrial complex remains low [15].

#### 4. Discussion

According to the Labor Market Index of the Institute for Forecasting and Macroeconomic Research (IFM), the Khorezm region is included in the group of regions with an average employment level. At the same time, the official unemployment rate does not exceed 9.5%, but these data do not take into account hidden unemployment, self-employment in the informal sector and seasonal employment, which is typical for rural regions.

The key problem is not the lack of jobs as such, but their low quality. Vacancies with low pay, without social guarantees and career growth prospects predominate. The average salary in the region is about 80% of the national average, which also limits the ability to attract and retain skilled labor.

The problem of human capital outflow should be emphasized separately. Young professionals with modern skills prefer to move to more developed regions, including Tashkent and foreign countries. According to IPMI, there are on average 5-6 job seekers per vacancy in the Khorezm region, which indicates that the local labor market is oversaturated with a shortage of jobs that meet the expectations of young people.

#### **The Khorezm region faces a number of structural constraints that hinder the development of human capital**

First, there is the high level of poverty. According to a report by the United Nations Development Program (UNDP), the level of multidimensional poverty in Khorezm is 19.1% - one of the highest in the country. This means that almost every fifth family in the region simultaneously experiences a lack of income, limited access to education, health services and safe living conditions.

Second, the natural and climatic conditions of the region are a serious challenge. Approximately 80% of the region's territory is deserts and salt marshes. Problems with water supply, soil salinization, environmental degradation associated with the disappearance of the Aral Sea have a negative impact on the health of the population and living conditions. The incidence rate among children and adolescents exceeds the national average in a number of indicators, especially in rural areas.

Thirdly, weak infrastructure - both transport and digital - limits access to quality services, hinders the development of entrepreneurship and limits the possibilities of distance education and remote employment.

#### **Institutional barriers and low level of population involvement**

One of the systemic limitations of human capital development in the Khorezm region is the low level of population participation in the decision-making process. Civic activity of the population remains low, which hinders the implementation of grassroots initiatives and the formation of a feedback system between society and government agencies. The lack of participation in governance limits the motivation for development among citizens, especially among young people.

Administrative barriers, bureaucracy and limited availability of information on social programs also hinder citizen involvement in educational, medical and labor projects. Sustainable development of human capital is impossible without strengthening horizontal ties between the state, business and society.

Thus, the Khorezm region has significant demographic and labor potential, which, with effective coordination of policies in the field of education, employment and

infrastructure, can become an engine of sustainable regional growth. However, in its current state, the human capital of the region is only partially realized, and its development is constrained by a number of barriers: low quality of education, poverty, limited infrastructure, weak connection with the labor market and low institutional activity.

To move to a qualitatively new stage of development, a comprehensive approach is needed, including:

- expanding access to quality education;
- development of highly productive sectors of the economy;
- strengthening the institutional potential of the region;
- investment in infrastructure and digital transformation;
- stimulating civic activity and youth initiatives.

### **Proposals for the effective use of human capital in the sustainable development of the region**

Authorities should strengthen intersectoral cooperation in personnel development. First, expand vocational training programs: introduce new state grants and benefits for students of technical specialties, create competence centers (using cluster technologies as examples). Secondly, improve the employment system: stimulate the creation of jobs in priority sectors through subsidies for small businesses and entrepreneurship, including support for young farmers and IT startups. It is also important to revise labor legislation, simplifying the regulation of self-employment and small businesses.

In the educational sphere, it is necessary to strengthen specialized training for the needs of the region. It is recommended to develop a dual education system in cooperation with businesses so that students gain practical skills. In addition, it is necessary to ensure high accessibility of preschool and school education: the spread of the practice of free meals for all students will increase attendance and academic performance. In the field of higher education, it is advisable to create branches of technical universities in Khorezm and increase funding for vocational schools.

In the field of healthcare, preventive programs are important (preserving the health of workers is an investment in capital) and the expansion of telemedicine in rural areas. Regional authorities can attract investment in medical care (for example, preferential loans for the construction of clinics), which will reduce morbidity and increase the working capacity of the population. Finally, direct investment in human capital is required through family support programs: a one-time payment at the birth of a child, preferential mortgages for young families, access to educational subsidies. These measures will stimulate the population to improve their standard of living and education, thereby strengthening the basis for sustainable development of the region.

Modern development of the regional economy increasingly depends on the ability to effectively use not only natural and financial resources, but also the intellectual and labor potential of the population. In this context, human capital is becoming a key factor in sustainable economic growth, social well-being and increasing the competitiveness of regions. This is especially true for countries with transition economies, such as the Republic of Uzbekistan, where the tasks of modernizing socio-economic institutions and ensuring the uniform development of territories are relevant.

Against the backdrop of global changes - digitalization, acceleration of technological transformations and new challenges, including migration and demographic shifts, the role of high-quality human potential in the formation of sustainable and inclusive economic models is increasing. In this regard, there is a need to rethink traditional approaches to human capital management at the regional level, strengthening coordination between education, healthcare, employment and social protection.

## **5. Conclusion**

The Khorezm region, having significant demographic potential, is actively involved in the implementation of national programs for the development of human capital.

However, structural problems remain: uneven access to education, high levels of hidden unemployment, insufficient diversification of professional training, and limited healthcare resources. These factors require a comprehensive analysis and development of scientifically based recommendations for activating human capital for sustainable regional growth.

Thus, the need for a scientific study of the mechanisms for activating human capital at the regional level is due not only to the internal priorities of the national socio-economic policy, but also to global trends that require new tools for managing human resource development. This study is aimed at identifying key problems, assessing the current state of human capital in the Khorezm region, and formulating practical recommendations for its effective use for sustainable economic and social development of the region.

The results of the study are useful for regional authorities in developing long-term development programs: they substantiate the need for active measures to stimulate education, healthcare, and employment. The proposed mechanisms (additional investments in educational institutions, business benefits, social subsidies) can be implemented as elements of regional strategies. On their basis, it is possible to create a "competency map" of the Khorezm region and develop industry roadmaps for the development of human capital. This will increase the adaptability of the economy to external challenges and achieve sustainable growth, harmoniously combining economic and social goals.

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