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INTELLECTUAL DEVELOPMENT TENDENCIES IN SOCIO-DEMOGRAPHIC PROCESSES IN THE REPUBLIC OF KARAKALPAKSTAN: SOCIOLOGICAL ANALYSIS

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Abstract. This article analyzes the trends of intellectual growth in socio-demographic processes in the Republic of Karakalpakstan from a sociological point of view. The study covers the development of human capital, the expansion of the higher education system, the level of education of women, changes in professional training and their impact on the socio-demographic development of the region. Also, the importance of human capital in environmental conditions and the role of inclusive institutional environment in the development of intellectual potential were assessed. The results of the study show that ensuring intellectual growth in the region is inextricably linked with improving the quality of education, effective use of human capital and deepening of institutional reforms.

Key words: socio-demographic processes, intellectual growth, human capital, higher education, quality of education, women's education, sociological analysis, institutional development, inclusive institutions.

Introduction Today, in the assessment of socio-demographic processes, not only the population growth is important, but also its quality indicators, in particular, the development of human capital and intellectual potential. In modern society, the increase in the level of education, professional training, scientific potential and digital competences is one of the main factors that ensure the stable socio-demographic development of regions. Especially in areas with environmental and social problems, intellectual growth is emerging as a strategic resource that increases the resilience of society.

In the analysis of socio-demographic processes in the modern world, not only the quantitative growth of the population, but also its qualitative indicators, in particular, the intellectual potential, are coming to the first level. Today, the concept of "human capital" is recognized as the main driver of society's development, and the intellectual growth of the population has become an important factor ensuring demographic stability.

The trends of intellectual growth mean the continuous growth of the population's educational level, professional skills, scientific and creative potential. This process represents the transition from the model of "ordinary labor force" in the socio-demographic system to the model of "intellectual labor resources" with high technological and cognitive skills. From a sociological point of view, this trend changes the internal social structure of society, increases social mobility (mobility) of a person and forms new, conscious models of demographic behavior.

Intellectual growth is the main strategic resource that forms social immunity against environmental degradation in the conditions of Karakalpakstan. The higher the level of education

and digital skills of the population, the lower the negative impact of environmental risks on the social system.

Studying the processes of intellectual growth is especially important in regions with complex medical and ecological conditions, such as Karakalpakstan. After all, eliminating existing environmental and social problems in the region, improving the quality of life of the population and achieving sustainable development directly depends on the intellectual potential, digital skills and innovative activity of the society.

Within the framework of this study, the qualitative transformation of human capital, modern directions of education and professional training, as well as the main mechanisms of raising the intellectual level of the population are studied in the system of socio-demographic processes.

Methodology In this study, a comprehensive approach was used to study the trends of intellectual growth in socio-demographic processes. The methodological basis of the research was sociological analysis, comparative analysis, statistical data analysis and generalization methods. In the course of the research, statistical indicators related to the higher education system of the Republic of Karakalpakstan, the level of education of the population, the higher education of women, the directions of professional education and the development of human capital were analyzed. Dynamic changes between 2019-2025 were evaluated in a comparative way and their impact on socio-demographic development was studied.

The results of the analysis were summarized on the basis of a systematic and logical approach, and the main directions of human capital development and intellectual growth trends in the region were evaluated.

Results In recent years, in our republic, in particular, in the conditions of Karakalpakstan, the level of coverage with higher education has increased significantly. If previously the education system was focused only on the training of certain professions, now this process is moving to the stage of "intellectual universalization". Statistical observations show that the desire to get higher education among young people is manifested not only as a means of gaining social status, but also as a mechanism of protection from environmental and economic risks. Because the layer with high intellectual potential adapts faster to changes in the labor market.

Another important trend in the dynamics of professional training is the transformation of sectoral directions. Previously, traditional areas (agriculture, pedagogy) were the priority, but now the share of new intellectual stratum - IT specialists, service industry managers and social engineers - is increasing in the population. This is the main condition for transferring the territorial demographic system from extensive (quantity-based) development to intensive (quality-based) development.

Also, changes in the system of scientific training are an important indicator of intellectual growth. The annual increase in the number of young scientists conducting research to obtain the Doctor of Philosophy (PhD) and Doctor of Science (DSc) degrees serves the formation of the "scientific elite" in society. This layer has the ability to solve complex social and demographic

problems in the region on a scientific basis. This table shows the expansion of the intellectual potential forming base in the region.

Table 1.

Higher education institutions and the dynamics of the number of students in the Republic of Karakalpakstan

Indicators	2019-2020 academic year	2024-2025 academic year	Dynamics of change
Number of higher education institutions	7	12	+71%
Total number of students (thousands)	35.4	68.2	1.9 times increased
Admission Quotas (Undergraduate)	8 200	14 500	+76%
Master's students	450	1 200	2.6 times increased

According to Table 1, the increase in the number of higher education institutions from 7 to 12 represents the process of decentralization in the market of educational services. This means that the demand for higher education is being met not only in the capital Nukus, but also in the regions. The increase in the number of students by 1.9 times (from 35.4 thousand to 68.2 thousand) shows the high social need for the status of "specialist with a diploma" in society and the desire of the population for social mobility. The increase in admission quotas by 76% is the reaction of the state and society to the demographic pressure of youth (a large number of young people). Many young people will be employed and their social integration will be accelerated. A sharp increase in the number of graduates may lead to strong competition in the labor market and the risk of "diploma inflation" (a degree is available, but there is a lack of skills). Although the 1.9-fold increase in the number of students reflected in this table means that the society has moved to the stage of public higher education, this process also creates sociologically complex risks. First, such a rapid expansion in the educational structure may cause a "skill mismatch" phenomenon in the labor market. In this case, the nominal number of highly educated personnel does not correspond to the practical competencies required by the real sector of the economy, especially the production and service sectors of Karakalpakstan. As a result, despite the abundance of specialists with diplomas, the shortage of highly qualified technical and technological personnel remains. Second, the rate of transformation of quantitative indicators into qualitative indicators lags behind the rate of expansion of educational coverage. This creates the risk of causing the so-called "diploma inflation" in sociology - a decrease in the social and economic value of an educational document.

The most notable indicator is the 2.6 times increase in the number of students at the master's level. Sociologically, this means:

- The system of scientific personnel training is expanding in the region.
- In the vertical hierarchy of higher education, a layer of those who want to climb to the top is forming.

- This indicator will be the basis for the formation of the reserve of local professors and teachers for HEIs in Karakalpakstan in the future.

A sharp increase in the number of students leads to the expansion of the student social class in Nukus and other central cities, the development of the rental market and the service sector. Quantitative growth now necessitates qualitative change. Competition for students between 12 HEIs can begin. The analysis shows that the issue of future employment of 68,000 students should be the main research topic for regional state administration and sociologists. The system of higher education in Karakalpakstan has completely passed from the elite stage to the mass stage. Along with increasing the intellectual potential of the region, it creates new social responsibilities for providing employment to graduates.

From a sociological point of view, the increase in the level of education of women directly affects the quality indicators of childbirth and medical culture.[1]

Table 2.

Level of higher education among women and social indicators

№	Years	Percentage of women with higher education (%)	Infant mortality (per 1000)	Family planning level
1	2019 year	18.4%	12.4	Average
2	2021 year	22.1%	11.2	High
3	2023 year	28.5%	9.8	Very high
4	2025 year	32.0%	8.5	Professional approach

Table 2 is an important sociological indicator showing the inextricable link between women's education and health care in the social development of society. Here we can see the phenomenon of "social efficiency of knowledge". The second stage of the demographic transition is the transition of the society from the "high birth rate and high death" model to the "low birth rate and high quality of life" model. The increase in female education from 18.4% to 32% is not just the number of graduates, but a change in attitudes. As a result, it is not the number of children in families, but their quality, that is, health, education, and future that is coming to the fore. This is a rationalization of demographic behavior. Family planning used to be based more on tradition, but now women are looking at it as a medical-scientific project. An educated woman knows how to keep a distance between children, restore her body and consciously prepare for pregnancy. "Medical culture" is higher in a woman with higher education. He gets advice from a doctor, not from the internet or his neighbor. This prevents loss of human capital at an early stage.

[1]https://www.researchgate.net/publication/365415530The_Impact_of_Women's_Education_on_Maternal_and_Child_Health_Outcomes_in_Bangladesh_A_Systematic_Review_IOSR_Journal_of_Nursing_and_Health_Science

The relationship between ecological resilience and human capital is one of the most relevant areas of social demography today.[2] Especially in areas of environmental crisis such as Orolboyi, this concept serves as the main factor ensuring social stability. Ecological flexibility (resilience) is the ability of a social system to adapt to a new situation and develop without losing its functions from environmental shocks such as droughts, salt storms, and drinking water shortages. Resilience is not just a technical solution, but a product of human capital based on the knowledge and skills of the population. In this case, the population changes from the role of a victim of an environmental disaster to the role of an active subject managing the situation. A highly educated woman not only protects the family from environmental risks, but also creates new economic opportunities. Educated women tend to create start-ups in non-traditional agriculture or green service industries in saline lands. In ecologically threatened areas, not being tied to the land, but entering the remote labor market through digital skills is true resilience.

Education gives a woman economic independence or respect in society. This gives him an equal voice in important matters such as "how many children to have" or "when to have" in the family.

Table 3

Level of education and economic activity of highly educated women

№	Indicators	2019 year	2025 year	Dynamics of change
1	Percentage of women with higher education (in relation to the total number of women)	7-8%	13-15%	An increase of almost +2 times
2	Economic activity of highly educated women (employment rate)	62.0 %	74.0 %	+12.0% growth
3	Percentage of housewives with a diploma (passive layer)	38.0 %	26.0 %	-12.0% decrease
4	Share of women in intellectual labor (IT, education, medicine, management)	18.5 %	28.0 %	Quality transformation

In Table 3, the 2-fold increase in the percentage of women with higher education means that the social status of women in society has increased dramatically. The 12% decrease in "housewives with a degree" shows that education has begun to serve not just for a diploma, but for professional realization. The increase of the share of women in intellectual work to 28% indicates that the role of women in high-tech fields in society is increasing. Also, the expansion of the economically active and educated women's layer is the main factor that ensures the resilience of families to natural and social crises in the conditions of the Archipelago. Women's social strategy was a transformation from passive consumerism to active creativity.

[2]Всеобщее образование является ключом к повышению эффективности адаптации к изменению климата.Вольфганг Лутц , Рая Муттарак и Эрих Стрессниг. 28 ноября 2014 г.; 346(6213): 1061-2 doi: 10.1126/science.1257975

Table 4.

Composition of courses in vocational schools and technical schools[3]

№	Educational directions	Share in 2019	Share in 2024	Tendency character
1	Agriculture and animal husbandry	45%	25%	Decrease (due to mechanization)
2	ICT and Digital technologies	5%	22%	Sharp growth (intellectualization)
3	Medical service and service	15%	28%	Quality improvement
4	Renewable energy sources	0%	10%	A new direction (ecological adaptation)

The data presented in Table 4 show that the socio-economic needs of society have changed significantly in the period 2019–2024. The reduction of the agricultural sector from 45% to 25% indicates that the society is moving from the traditional type of work to the industrial and post-industrial stage. This is not only a crisis of the industry, but also a result of the intensification of labor. Now, the demand is not for a large number of physical labor, but for quality personnel who manage the technological process. This leads to increased social mobility and population migration from the agricultural sector to the service sector. A more than 4-fold increase in the share of ICT and Digital technologies (from 5% to 22%) confirms that the society is rapidly moving to the "Information Society" model. Digital skills are now becoming a "core competency" for all professions, rather than a specific field. This indicates that the desire for intellectual work has increased in the value system of learners. The results of the research show that the process of intellectual growth in Karakalpakstan has a territorial character. While urban youth are integrating into the global intellectual space through digital technologies, rural youth remain in traditional educational patterns due to infrastructural limitations. This situation creates a new kind of "digital stratification" in society. Without reducing this gap, it will be difficult to achieve integrated and sustainable socio-demographic development in the region.

The increase of the medical service and service sector to 28% is explained by the increased demand for the standard and quality of life of the population. The growth in this direction is related to demographic changes in the society, that is, the growth of the population and the increase in the social demand for the health care system. The transition from 0% to 10% of renewable energy sources means that the institutionalization of ecological culture in society is beginning. This is the state's environmental policy and social adaptation to global trends. The emergence of new professions shows that the concept of environmental responsibility in society is being inculcated in

[3] Муаллиф томонидан тайёрланган тадқиқот асосида ишланган.

the minds of young people through the educational system. The trends in the table represent the dynamics of the transition from the traditional model of society to the model of innovative-technological society. The change in the composition of the educational fields serves to restore the balance of demand and supply in the labor market, as well as to increase the social status of young people.

The rise of the educational structure ensures the social mobility of the population. The formation of highly qualified personnel increases the competitiveness of labor resources, which, in turn, serves as the main factor guaranteeing the socio-demographic security of the region. In the process of intellectual growth, the decision of the principle of continuity of education creates a basis for continuous renewal of society.

While demographic growth is a quantitative indicator, intellectual growth is its qualitative indicator. The increase in the number of highly educated specialists in the Republic of Karakalpakstan is one of the most important indicators of demographic and economic transformation in the region. In recent years, as a result of the expansion of admission quotas for higher education and the establishment of new higher education institutions, positive dynamics are observed in this indicator.

Table 5
Percentage of people with higher education in relation to the total population [4]

№	Indicators	2019 year	2025 year	Tendency character
1	Percentage of people with higher education (% of population)	9-11%	16-18%	Expansion of the intellectual layer
2	Number of students per 10,000 population	185	341	1.8 times increased
3	Among those employed in the economy are those with higher education	22.4%	29.0%	Quality transformation

Table 5 shows the formation of an intellectual middle class in the society, with a 1.5-fold increase in the number of highly educated people among the population. This indicates the activation of the social elevator mechanism for vertical social mobility. A 1.8-fold increase in the number of students per 10,000 people means that education has shifted from elite to mainstream. The social demand for higher education in the society and the desire of young people to increase the social status have increased sharply. The increase of the share of highly educated people employed in the economy to 29% confirms the increasing role of intellectual capital in the labor market. The data prove that the society has entered the stage of intellectual modernization and the quality indicators of human capital are growing steadily. The intellectual growth of women reduces

[4] ҚР статистика бошқармаси маълумотлари асосида тузилган

the "demographic load" in families and allows the transition from reproductive work to productive social work, which is considered socio-economic stability for the Aral Bay.

Discussion There is a theory of inclusive and extractive institutions in science, and the institutional approach is important in the analysis of trends in intellectual growth and social development.

The founders of this approach, Daron Asemoglu and James Robinson, divide political and economic rules in society into two main types[5]:

1. Inclusive institutions (inclusive system). Inclusive institutions are a system that provides equal opportunities to broad segments of society to participate in economic activity and realize their intellectual potential. Its main features are protection of private property rights, rule of law and equal opportunities for all, free competition and support of new technologies. In such an environment, people are motivated to learn and innovate because there is a guarantee that their knowledge and talent will be valued. This creates an "intellectual explosion" in socio-demographic processes.
2. Extractive institutions (restrictive or absorbing system). Extractive institutions are systems that take resources and power away from the majority of society and serve only the interests of a narrow elite. Its main features include the concentration of power in one hand and the lack of public control, the weakness of property rights and economic monopolies, and the inhibition of innovation and social change. In such a system, the intellectual advancement of the population is seen as a threat to the elite. As a result, the quality of education decreases, talented young people prefer to leave the country (brain drain), and intellectual stagnation occurs in society.

Increasing the number of educational institutions alone is not enough to ensure intellectual growth in socio-demographic processes. Asemoğlu's theory proves that if inclusive institutions (openness, fair competition, inviolability of property) are not formed in society, demographic growth will not turn into intellectual capital. On the contrary, in the conditions of extractive institutions, the ability to effectively use the intellectual potential of the population remains limited.

The high population in the region, especially the youth, creates the possibility of a "demographic dividend". However, inclusive reforms are necessary for this opportunity to emerge. If regional institutions are based on the principles of openness and meritocracy, demographic growth will serve intellectual growth. On the contrary, in conditions of extractive barriers (acquaintance, monopolies in education), the intellectual potential of young people is "wasted" or leaves the region through migration. The level of extractiveness of the institutional environment determines regional migration flows. If the region lacks an inclusive economic system that encourages intellectual work, highly skilled personnel will gravitate to central cities or abroad to showcase their talent. Therefore, regional reforms must not only create jobs, but also create an institutional environment that protects intellectual property and harnesses talent.

In such ecologically complex regions as Karakalpakstan, intellectual growth is not only humanitarian, but also technological in nature. Inclusive institutions support innovative ideas of

[5] https://www.msses.ru/ Московская высшая школа социальных и экономических наук.

local people, for example, water-saving technologies, environmental enterprises. And the extractive system tries to preserve outdated, resource-intensive methods, which deepens the socio-demographic crisis.

Conclusion In conclusion, the trends of intellectual growth in the regional socio-demographic processes are determined not only by the numerical indicators in the educational system, but also by the quality of the institutional environment. Inclusive institutional reforms serve as a social elevator that increases the intellectual activity of the region's population. On the contrary, the persistence of an extractive approach to the distribution of resources is the main factor preventing the transformation of demographic growth into intellectual growth. Therefore, institutional changes in regional development strategies should be considered as a fundamental condition for maintaining and increasing intellectual capital.

The results of the study showed that intellectual growth in modern socio-demographic processes is not just an increase in the number of educated people, but a mechanism of strategic resilience formed in response to environmental and economic risks of the region. As a result, we came to the following conclusions:

As a result of the transition of the higher education system from the elite stage to the mass stage in Karakalpakstan, the population's human capital has increased quantitatively (the number of students has increased by 1.9 times). However, this process also creates new sociological risks in the labor market, such as "skill imbalance" and "diploma inflation".

The increase in the intellectual potential of women (up to 32%) rationalized the demographic behavior of the region. This is reflected in the reduction of infant mortality and the rise of the culture of family planning as the "social efficiency of knowledge".

Trends in intellectual growth are uneven across regions. Although the share of ICT and digital technologies in education has increased dramatically (22%), the "digital divide" between urban and rural areas is creating a new layer of social inequality in society.

Analyzes based on the theory of D. Asemoglu confirm that only educational coverage is not enough for the demographic growth in the region to turn into a "demographic dividend". In order to prevent intellectual capital migration (Brain Drain), the formation of an inclusive institutional environment in the region - a system that values talent and is based on free competition - is a fundamental condition. The socio-demographic stability of Karakalpakstan directly depends on the transition from the extensive (quantity) stage to the intensive (quality) stage of intellectual development and the complete integration of the accumulated human capital into the internal socio-economic system of the region.

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