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FACTORS INFLUENCING EMPLOYMENT AND ITS REGIONAL FEATURES IN SOUTHERN UZBEKISTAN

ABSTRACT

This article examines the issue of employment in the Republic of Uzbekistan, where the population is rapidly increasing and the number of new entrants to the labor market continues to grow each year — with a particular focus on the Surkhandarya Region, located in the southern part of the country. Despite possessing abundant natural resources, favorable environmental conditions, and a substantial labor force, Surkhandarya remains among the least developed regions in terms of socio-economic progress. The study employs various research methods, including statistical analysis, cartographic modeling, Geographic Information Systems (GIS), and case study analysis. The article assesses the influence of geographical and demographic factors on employment in Surkhandarya — one of the regions with the lowest employment levels in Uzbekistan — and analyzes the dynamics of these factors over time. Furthermore, the research explores the interrelation between geographical and demographic factors and employment in Surkhandarya, located in the southern part of Uzbekistan. The region was evaluated using a geographical assessment scale to measure the impact of natural conditions and resources on socio-economic development. Based on data provided by the State Committee of the Republic of Uzbekistan on Statistics, the study analyzes demographic factors influencing employment in Surkhandarya from 2010 to 2025 and maps these changes using GIS technologies. The findings reveal that Surkhandarya records one of the lowest employment levels among the regions of Uzbekistan despite possessing sufficient natural, socio-economic, and demographic potential. The results also indicate that ensuring sustainable employment in the region requires evidence-based measures aimed at developing underperforming economic sectors and implementing a region-specific migration policy tailored to local conditions.

KEYWORDS: population, Southern Uzbekistan, Surkhandarya Region, natural conditions, recreation, GIS technologies

INTRODUCTION

In the study of employment, particular attention is devoted to the formation of labor resources, their quantitative dynamics, territorial structure, and the spatial distribution of factors influencing employment. These processes and determinants, in turn, vary across regions depending

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on their natural and socio-economic conditions, thereby reflecting broader demographic trends, regional characteristics, and the physical geography of countries or their specific administrative units. In the contemporary context of globalization, special emphasis is placed on understanding the formation and spatial organization of labor resources, identifying socio-demographic and economic-geographical factors, examining territorial patterns of labor utilization, and developing strategic approaches to enhance employment levels.

In recent years, employment opportunities for the global population, particularly youth, have been steadily improving. According to the International Labour Organization, the unemployment rate decreased from approximately 13.7 % in 2020 to 13 % in 2023, with projections indicating a further decline to 12.8 % in 2024 and 2025[1].

In the Republic of Uzbekistan, the proportion of labor resources entering the labor market each year is recognized as one of the most dynamic indicators not only in Central Asia but also among the Commonwealth of Independent States (CIS) countries. Ensuring productive employment, reducing unemployment, and expanding job opportunities remain among the most critical socio-economic challenges facing the Republic of Uzbekistan. These issues are particularly pronounced in the Surkhandarya Region, located in the southern part of the country, where labor resources continue to grow steadily due to favorable demographic conditions. As of January 1, 2025, the population of Uzbekistan reached 37.54 million, reflecting an annual increase of approximately 700 000 to 745 000 people. This positive demographic trend is also characteristic of the Surkhandarya Region, which occupies an area of 20.1 thous. km² — equivalent to 4.47 % of the nation's total land area. The region's population, as of the same date, amounted to 2.95 million, accounting for 7.8 % of the country's total population. Surkhandarya stands out from other regions due to its distinct geographical location, varying levels of socio-economic development, and the unique ethnic composition, cultural traditions, and spatial organization of its population.

The Surxondaryo Region, which shares borders with three countries — Tajikistan, Turkmenistan, and Afghanistan — is among the regions of Uzbekistan experiencing the most rapid population growth in recent years. As a consequence of this demographic expansion, the size and volume of the region's labor resources have increased considerably, with a nearly balanced gender composition and a predominantly young working-age population. The formation of labor resources in Surxondaryo is primarily driven by natural population growth, while the impact of mechanical (migration-induced) population movement remains relatively limited. The region's geographical location, natural conditions, and abundance of natural resources play a decisive role in shaping both its demographic dynamics and the development of its labor resources. However, despite these favorable demographic trends and the availability of significant resource potential, the overall employment level in Surxondaryo cannot be considered satisfactory compared to other regions of the Republic of Uzbekistan. Several interrelated factors influence the formation and structure of employment in the region. Surxondaryo's relative isolation from the more industrially developed urban centers of Uzbekistan, its peripheral position in the country's extreme south, and its proximity to Afghanistan — a neighboring state marked by long-term political instability — have all exerted a notable impact on the region's employment conditions. Accordingly, the primary objective of this study is to analyze the size, composition, and dynamics of labor resources in the Surxondaryo Region, to identify the social, demographic, and geographical determinants affecting employment, to assess the territorial features of labor distribution, and, based on the available regional capacities, to propose strategic directions for improving employment levels among the population.

[1] ILO. Global Employment Trends for Youth, 2024: Decent Work, Brighter Futures. Geneva: International Labour Office

RESEARCH MATERIALS AND METHODS

Given the extensive global efforts to promote employment, scholarly research on population employment has remained a consistent and important area of inquiry. This sustained academic interest arises from the fact that, in many countries, employment levels are closely interrelated with the population's standard of living, the costs of workforce education and skill development, job placement mechanisms, and financial support for the unemployed. Numerous researchers — particularly economists and geographers — have examined issues related to population dynamics, labor resources, and employment structures, contributing to a deeper understanding of the socioeconomic and spatial factors influencing labor market development.

The theoretical foundations of population employment have evolved over several centuries, giving rise to four major schools of economic thought: the classical, Keynesian, monetarist, and institutionalist approaches. Scholars representing these paradigms have offered differing interpretations of employment dynamics and the role of the state in regulating labor markets. Proponents of the classical school, in particular, maintained that full employment is the natural state of a market economy and that minimal government intervention constitutes the most efficient policy framework. A central figure in the development of classical theory was the English economist Adam Smith, who introduced the concept of the "invisible hand". According to this principle, in a freely functioning market economy, individuals pursuing their own interests inadvertently contribute to the efficient allocation of resources and the overall welfare of society, thereby achieving a self-regulating equilibrium. In his seminal work, "An Inquiry into the Nature and Causes of the Wealth of Nations (1776)", Smith argued that the prosperity of nations is determined by their per capita income and that under conditions of perfect competition, unemployment cannot persist because wages and prices adjust freely. Furthermore, Smith posited that the structure of employment is determined by variations in profit rates across sectors, with both capital and labor naturally flowing toward those industries that offer higher returns.

The founder of Keynesian theory, J. M. Keynes, identified the achievement of full employment as one of the primary goals of state intervention in the labor market. Keynes developed the theory of a state-regulated economy, which he outlined in his seminal work, "The Theory of Employment, Interest, and Money (1936)". In this work, he proposed a novel approach to employment theory. According to Keynes, when aggregate demand in a particular industry is low, the level of employment within that industry will decrease. He argued that to increase aggregate demand, it is essential to make loans more affordable and to reduce taxes [*Lerner*, 2013]. Keynes' ideas suggest that the condition for achieving full employment is the elimination of unemployment, which, in his view, should be zero [*Curry*, 2016].

The impact of wages on employment has also been extensively studied by scholars. In this regard, American economist C. Brown conducted a comprehensive analysis of the effect of the minimum wage on employment in the United States [*Brown* et al., 2014]. Similarly, another American scholar, David Card, examined the impact of a minimum wage increase in California in 1988. He found that raising wages did not have a negative effect on employment.

In Uzbekistan, geographers, economists, and demographers have conducted significant scientific research on the formation of labor resources, employment, and demographic processes. For instance, K. Kh. Abdurakhmanov conducted studies focusing on the economic aspects of labor resource formation [*Abdurakhmanov*, 2004]. A. A. Kayumov, whose primary research area encompasses demography, population studies, and labor resource geography, examined the socio-geographical foundations of labor resource formation and development in Uzbekistan, providing valuable insights into the country's labor resources [*Kayumov*, 1997]. Additionally, from a physico-geographical perspective, Sh. Sharipov studied the relationship between green areas and the living conditions of the population in Tashkent [*Sharipov* et al., 2024].

The role of Z. N. Tojiyeva in research on the natural movement of the population in Uzbekistan is particularly noteworthy. Her works on the socio-economic issues of population growth and distribution, exemplified by her study of the Jizzakh Region [*Tojiyeva*, 1998], as well as her research on demographic processes in the Republic of Uzbekistan and their territorial characteristics [*Tojiyeva*, 2017], stand out as significant contributions to this field. Furthermore, Z. N. Tojiyeva provided detailed insights into the demographic dynamics and distribution of the rural population in Uzbekistan, along with its territorial characteristics [*Tojiyeva* et al., 2024]. She also conducted research on labor resources and employment, offering a comprehensive analysis of the labor market and employment conditions in Uzbekistan in her scientific works [*Tojiyeva* et al., 2021].

G. B. Utepova, in her study of the Republic of Karakalpakstan, provided data on the demographic development of rural areas and the issues related to labor resources, highlighting the historical-geographical and demographic features that characterize the natural and migration movements of the rural population. R. B. Kadirov, in his research, developed strategies for the effective utilization of labor resources in the regions of the Fergana Valley, Republic of Uzbekistan [*Kadirov*, 2021].

A number of studies have also been conducted on the demographic situation, population size and dynamics, labor resources, the labor market and its utilization, as well as the issue of population employment in the Southern Uzbekistan Region under study. In this regard, the geographical research conducted by geographer N. Yuldashev [*Yuldashev*, 2017, p. 45] aims to identify the socio-demographic factors influencing the formation of labor resources in the Kashkadarya Region and their territorial characteristics, as well as to determine the key directions for increasing the population's employment rate. The age-sex and territorial composition of the population in the Kashkadarya Region, along with the forecast parameters for the working-age population by 2030, were developed using the cohort-component (age shift) method. Meanwhile, A. A. Islamov studied the regional characteristics of labor market formation in the Kashkadarya Region, focusing on the labor market dynamics within rural districts. He also provided practical recommendations for the rational development of labor demand, taking into account local conditions and factors in the labor market. Additionally, Islamov emphasized the role of small and private entrepreneurship in enhancing employment and identified priority areas for improving its efficiency [*Islamov*, 2004].

For the first time in Uzbekistan, Professor L. Z. Ibragimov assessed the territorial distribution of employment in the labor markets of cities and rural districts in southwestern Uzbekistan by geographical altitudinal zones (desert, foothill, and mountainous areas), economic-geographical features (such as economic-geographical location, territorial division of labor, specialization, territorial production complexes, and zoning). He also enhanced the scientific and methodological foundations of this research. Using econometric modeling and the Pearson multifactorial correlation method, Ibragimov identified 18 social and economic indicators for the regions of southwestern Uzbekistan and determined the level of their dependence on employment (low, medium, and high) [*Ibragimov*, 2022].

In addition, various approaches to labor resources have been described in the research works of scientists such as R. Hodiev, M. Yangiboev, M. Erdonov and D. Egamova. However, despite these contributions, the labor resources and population employment in the Surkhandarya Region, along with the factors influencing them, have not yet been sufficiently studied within the context of the region.

Based on the works of scholars who have studied population dynamics and related processes, this research evaluates the population and employment characteristics of the Surxondaryo Region in southern Uzbekistan. The influence of geographical factors on population employment, as well as the impact of natural conditions and resources on the socioeconomic development of

the area, was assessed through a geographical evaluation scale applied to the districts within the region.

The effects of demographic factors influencing employment were analyzed statistically by examining changes across districts for the period 2010–2025. In addition, the demographic factors affecting employment in Surxondaryo Region were mapped through cartographic modeling and Geographic Information Systems (GIS) technologies, which provided a spatial visualization of the relationships between demographic dynamics and employment patterns in the region.

RESEARCH RESULTS AND DISCUSSION

Employment is a pressing issue in the Surkhandarya region, where the majority of the population is of working age[1]. Residents face significant challenges in securing decent employment. Despite the availability of resources and the fact that most of the region's population resides in rural areas, the underdevelopment of industrial sectors in the republic further limits employment opportunities. As a result, the majority of the rural population is primarily engaged in agriculture and agribusiness. However, the region's natural resource potential and abundant labor force offer opportunities to enhance employment further. To achieve this, it is crucial to study the factors influencing employment and identify promising strategies for its growth.

The geographical location of Surkhandarya distinguishes it from other regions. Situated in the southernmost part of the Republic, it is one of only two regions that share borders with three neighboring countries. To the south, it borders Afghanistan along the Amu Darya River; to the north, northeast, and east, it borders Tajikistan; to the southwest, it borders Turkmenistan; and to the northwest, it borders Kashkadarya Region. The region covers an area of 20.1 thousand km², which accounts for 4.47 % of the country's total area, and its population stands at 2 945.5 thousand (2025), or 7.84 % of the national population. Surkhandarya includes the city of Termez and 14 districts. While the total birth rate in the republic has declined significantly since independence, this indicator remains higher than the national average in Surkhandarya. In particular, the regions of Kashkadarya, Surkhandarya, and Samarkand have experienced relatively rapid population growth in recent years. Consequently, the demographic potential of these regions continues to increase [*Ibragimov*, 2022]. The stark differences in natural conditions and resources, as well as socio-economic development opportunities, have influenced the population distribution. From a natural geography perspective, the region comprises the Hisar Range and its branches, including Baysuntog, Kokhitantog, Bobotog, and the Surkhan-Sherabad Valley. The terrain of Surkhandarya consists of both mountainous and plain areas, gradually decreasing and expanding from north to south.

The geographical location of Surkhandarya Region influences the formation of employment among its population. The region's natural conditions and resources play a significant role in shaping employment opportunities. Notably, Surkhandarya stands out from other regions due to its agricultural specialization, which is largely a result of its southern location and subtropical climate. The population has historically been concentrated in the Surkhan-Sherabad Valley. According to historical records, during the period of the Bukhara Emirate, the population of Surkhandarya was 167 000, with a population density of 7.9 people per km².

As of 2025, the population of Surkhandarya Region stands at 2 945.5 thousand people, with a population density of 146.5 people per km². However, due to the region's uneven terrain and natural conditions, the population is not distributed evenly across the area. Historically, people have tended to settle in locations where living conditions were more favorable, gradually engaging in various activities that contributed to the development of diverse economic sectors. Similarly, the population of Surkhandarya has long been settled. In this context, M. Mirakmalov's article provides

[1] Web resource: https://stat.uz/ (accessed 07.07.2025)

an insightful explanation of the role of natural geographical conditions in the formation of toponyms for settlements in the region [*Mirakmalov* et al., 2023]. The uneven population distribution across the region is primarily attributed to its complex orographic features and the uneven development of inter-district productive forces.

Table 1. Classification of the population across the regions of the Republic of Uzbekistan by total fertility rate (per 1 000 inhabitants)

Total birth rate (per 1 000 population)	**Provinces belonging to the groups**			
	2010	**2015**	**2020**	**2024**
Up to **20.0**	Tashkent City	Tashkent City	–	–
Up to **20.1–22.5**	Bukhara, Navoi, Tashkent regions	Bukhara, Navoi, Tashkent regions	Tashkent City, Bukhara, Tashkent, Khorezm regions and the Republic of Karakalpakstan	Tashkent City, Bukhara, Tashkent regions and the Republic of Karakalpakstan
Up to **22.6–25.0**	Andijan, Namangan, Samarkand, Syrdarya, Fergana, Khorezm regions and the Republic of Karakalpakstan	Andijan, Namangan, Samarkand, Syrdarya, Fergana, Khorezm regions and the Republic of Karakalpakstan	Navoi, Syrdarya, Fergana regions	Navoi, Syrdarya, Khorezm regions
Up to **25.1–27.5**	Jizzakh, Kashkadarya, Surkhandarya regions	Jizzakh, Kashkadarya, Surkhandarya regions	Andijan, Jizzakh, Kashkadarya, Namangan, Samarkand regions	Andijan, Jizzakh, Namangan, Samarkand, Fergana regions
Greater than **27.6**	–	–	Surkhandarya region	Kashkadarya, Surkhandarya regions
Republican average	**22**	**23.5**	**24.6**	**24.9**

The table was compiled by the authors based on data from the National Statistics Committee of the Republic of Uzbekistan

The uneven distribution of the population across the Surkhandarya Region, influenced by topographical features, is a significant factor affecting employment. Population density is highest in the foothill areas and regions with abundant water resources, where labor resources are also concentrated. In contrast, the southern parts of the region, despite their vast area, are sparsely populated. The average population density in the region is 146.5 people per km². However, this figure varies considerably — from 39.6 people per km² in Boysun District to 376.9 in Angor District (excluding the city of Termez) (Table 2). This indicates a high degree of internal disparity, with a regional population distribution coefficient of 9.5. Nonetheless, the average population density in Surkhandarya exceeds the national average. It is noteworthy that in some of the region's largest districts — Boysun, Sherabad, and Sariosiyo — population density remains below 100 people per km².

Table 2. Administrative-territorial division of Surkhandarya region (January 1, 2025)

Administrative-territorial units	Date of establishment	Area (thousand km²)	Population (thousand people)	Population density (people per 1 km²)	Urbanization level, %	Rural districts	Total cities	Small towns	Village population points
Surkhandarya Region	**06.03.1941**	**20.10**	**2 945.5**	**146.5**	**36.1**	**14**	**8**	**112**	**859**
Termez city		0.04	207.3	5 182.5	**100**	0	1	0	0
Districts:									
Oltinsoy	23.11.1981	0.57	197.4	346.3	40.2	1	0	14	46
Angor	16.04.1952	0.39	147.0	376.9	48.5	1	0	12	27
Bandikhon	18.05.1992	0.68	85.3	125.4	17.9	1	0	3	40
Boysun	29.09.1926	3.21	127.1	39.6	41.8	1	1	4	49
Muzrabot	25.12.1968	0.74	156.8	211.9	36.5	1	0	10	48
Denov	02.09.1926	1.15	430.5	374.3	35.2	1	1	11	106
Jarkurgan	29.09.1926	1.16	244.0	210.3	19.9	1	1	5	66
Kumkurgan	24.03.1977	1.83	261.6	143	32.4	1	1	11	76
Kizirik	06.03.1975	0.38	126.9	333.9	26.5	1	0	5	42
Sariosiyo	29.09.1926	3.82	232.9	61	19.1	1	1	4	115
Termez	29.09.1926	0.83	87.2	105.1	31.1	1	0	7	27
Uzun	12.01.1942	1.84	192.4	104.6	23.3	1	0	9	77
Sherobod	29.09.1926	2.73	214.9	78.7	29.8	1	1	7	96
Shurchi	09.02.1935	0.72	234.2	325.3	34.5	1	1	10	44

The table was compiled by the authors based on data from the National Statistics Committee of the Republic of Uzbekistan

Natural-geographical factors play a crucial role in shaping the labor market and ensuring population employment. The natural conditions of a territory, along with the availability of natural resources, significantly influence both the quantity and quality of labor resources. The presence and development of natural resources — such as the discovery and exploitation of mineral deposits — contribute to the formation of specialized labor markets and increased employment opportunities. Conversely, in areas with harsh natural conditions and limited resource availability, the labor market tends to be underdeveloped, and employment levels are generally low. For instance, the Sariosiyo, Denov, Uzun, and Shorchi districts of the Surkhandarya Region benefit from favorable natural conditions and sufficient water resources, which support a high concentration of labor resources. In the Jarkurgan and Sherabad districts, recent development and processing of mineral deposits have led to an increase in employment within these sectors. In contrast, the unfavorable natural conditions in the Muzrabot and Kizirik districts present challenges to the territorial organization and development of the labor market.

Water resources represent one of the primary geographical factors influencing the distribution of population, economic activity, and employment. Historically, human settlement in the region has been concentrated around areas with reliable access to water. In the Surkhandarya Region, the Surkhandarya and Sherabad rivers — among the most significant rivers in the country — have played a central role in shaping patterns of population distribution and economic development. The majority of the region's population resides densely in the valleys of these rivers, where favorable conditions for agriculture, infrastructure, and livelihoods have contributed to concentrated settlement and higher levels of economic activity.

Uzbekistan is located within a closed basin and is classified as one of the countries with limited water resources. Although the Surkhandarya region is relatively better endowed with water compared to other regions of the republic, it is nonetheless facing an increasing problem of water scarcity. This is particularly concerning given that the majority of the region's population is engaged in agriculture. Despite this challenge, extensive forms of economic development — characterized by inefficient use of land and water — still dominate much of the region, while intensive, high-productivity sectors remain underdeveloped. This imbalance presents a serious challenge for the future, as the need to transition toward intensively developing sectors becomes increasingly urgent. Historically, the population of the region has depended heavily on the broad use of agricultural land in the Surkhan-Sherabad Valley, where agriculture continues to be the primary source of income.

At the same time, it is important to recognize that the Surkhandarya Region possesses a significant raw material base, making it one of the key areas in Uzbekistan for the development of the fuel and energy sector, as well as the non-ferrous metallurgy, chemical, and construction materials industries. In recent years, the discovery of reserves of oil, natural gas, coal, polymetallic ores, rock salt, and cement has further expanded the region's industrial potential.

These resources present substantial opportunities for economic diversification and industrial growth, which, if effectively utilized, could enhance employment and contribute to balanced regional development.

Water resources play a crucial role not only in the development of agriculture but also in determining the spatial distribution of processing enterprises and service facilities that are directly tied to agricultural production. These resources significantly influence the level of employment in such sectors. In this context, geographers studying the ecological interdependence between employment sectors and water availability have noted that "…the drying up of the Aral Sea has caused changes not only in the natural and geographical environment but also in the socio-economic conditions of the Aral Sea Region. This has led to a further exacerbation of the problems in and around the Aral Sea. The population living in the Aral Sea basin, including Uzbekistan, is facing the consequences of this environmental crisis. There are also notable shifts

in the economic activities of the region's population" [*Ibragimova* et al., 2019]. These findings underscore that water resources are integral to sustaining economic activity, and their depletion results in either a transformation of local livelihoods or a decline in employment levels.

As is well-established, service and processing enterprises are predominantly located in proximity to water sources, which are vital for their operations. Consequently, the reduction in water resources has had a considerable impact on these sectors. According to the 2023 statistics for Surkhandarya, 332.9 thousand individuals, representing 32.9 % of the total employed population, work in agriculture, forestry, and fisheries. This sector has the highest employment rate within the republic. The figures clearly highlight that a substantial proportion of the region's workforce is engaged in these industries, underscoring the critical importance of water resources for their sustenance. However, in recent years, the share of the employed population in this sector has been declining, primarily due to water resource challenges. Specifically, the proportion of the population employed in agriculture, forestry, and fisheries fell from 38.0 % in 2010 to 36.9 % in 2017, and further to 32.9 % in 2023 (Surkhandarya Statistical Office, 2023). Furthermore, the annual growth rate of agriculture, forestry, and fisheries, which was 105.5 % in 2020, declined to 101.8 % in 2022. This decrease is directly attributable to the reduction in the availability of water resources in the region.

It is important to highlight that the agricultural sector plays a crucial role not only in the economy of the Surkhandarya Region but also in the broader context of Uzbekistan's economy. The sector is deeply integrated into the lives of the region's population, as a significant portion of the population resides in rural areas, and a high percentage is employed in agriculture, forestry, and fisheries. Furthermore, approximately 26.9 % of agricultural land in the region is irrigated, which underscores the critical importance of water resources. However, given the anticipated decline in water reserves both in Surkhandarya and across the republic, challenges will inevitably arise in terms of employment. Such challenges are likely to lead to reduced agricultural production and a decline in the workforce employed in this sector, as well as in related industries. Therefore, it is imperative to begin addressing these potential issues proactively by exploring and implementing sustainable solutions for water resource management and diversification of employment opportunities in the region.

Employment is land resources, particularly agricultural land. Irrigated and fertile lands play a significant role in the employment of the population. In recent years, intensive efforts have been made in Uzbekistan to optimize the use and classification of land resources. According to official data, the total land area of the republic is 20.8 million ha, with 4.3 million ha classified as high-value irrigated lands. In the Surkhandarya Region, the majority of land resources are also devoted to agricultural use. Additionally, land is utilized for social, recreational, health, and environmental protection purposes.

To address employment issues, agricultural lands in the region have been leased to unemployed individuals and young families for 30 years, a policy aimed at increasing employment and productivity. This initiative is an excellent way to boost agricultural output and create more job opportunities. However, it is essential to note that the declining availability of water resources poses a significant challenge. To ensure the sustainability of land use, continuous monitoring is necessary to prevent soil erosion, salinization, and the formation of ravines. Furthermore, providing assistance to land lessees in effectively utilizing these lands and connecting them with markets for their products is crucial for maximizing both agricultural productivity and employment.

The Surkhandarya Region, with its high population growth rate, ranks seventh in the Republic of Uzbekistan in terms of demographic potential. According to the last census in 1989, the region's population was 1 253.8 thous. people, and by 2025, this figure is projected to increase by 2.3 times. Although the rate of demographic growth has slightly slowed in recent years,

it remains one of the highest in the republic. This rapid population increase highlights the urgent need to create jobs and ensure employment opportunities in the region. The challenges of job creation and population placement are directly linked to geography, with natural conditions and resources playing a pivotal role in shaping the region's economic activities and employment prospects.

The economy of the Surkhandarya Region is shaped by its geographical location, natural conditions and resources, and historical development factors. The regional economy is predominantly agrarian. It contributes 4.2 % to the republic's GDP, 1.7 % to industry, 9.1 % to agricultural products, 6.4 % to retail trade, and 4.2 % to paid services. The region's share in the production of consumer goods is 2.4 %, 4.1 % in capital investments, 1.9 % in exports, and 8.2 % in imports (2024). Based on these figures, it can be concluded that industries of national importance dominate the region, while other sectors remain underdeveloped, with a significant portion of the population employed in agriculture. This highlights the urgent need to establish production enterprises in the region, given its high and growing demographic potential, and to promote the development of sectors beyond agriculture. A key factor contributing to this challenge is that the majority of the emerging labor force in the region consists of young people, which exacerbates the employment issue.

In the territory of Surkhandarya Region, the population is distributed differently across altitudinal zones. The districts of Termez, Jarkurgan, Angor, Kizirik, and Muzrabad, particularly their villages, are all located at altitudes up to 500 meters above sea level. In contrast, the villages of Boysun, Sariosiyo, and Uzun districts have no settlements at such low elevations; the majority of them are situated in foothill and mountainous areas. In the region, only Oltinsoy District has settlements across all elevation ranges [*Soliyev* et al., 2005]. These relief-related factors inevitably influence the employment of the population. Consequently, the employment patterns in the region have formed in accordance with these geographical conditions.

The territory of Surkhandarya Region can be broadly divided into two parts: the northern mountainous and foothill areas, and the southern plain steppe region. In the northern part, agriculture and horticulture are primarily well-developed, with the majority of the population engaged in these sectors. Additionally, livestock breeding is also significant in these areas. A small proportion of the population is employed in production, while the remainder works in non-production sectors. Due to the varied relief structure in the mountainous and foothill regions, the types of agricultural crops also differ. In these areas, both irrigated agriculture and sloping land farming, along with pasture cattle breeding, are practiced. In contrast, the southern part of the region is characterized by well-developed irrigated agriculture and sheep breeding. This transformation from desert to arable land has been facilitated by the construction of canals that provide a steady water supply, which plays a crucial role in crop cultivation. In the remaining regions, pasture livestock farming, particularly sheep and goats, is prevalent on low-yielding lands. A substantial portion of the population's income is derived from these sectors. However, in most parts of both regions, agriculture and livestock farming are extensively practiced, which results in lower, rather than higher, incomes for the population.

Among the factors influencing population employment, the availability of natural recreational resources is particularly significant, especially in the case of Surkhandarya Region, which is rich in such assets. In addition to its agricultural sector, the region is endowed with a variety of natural resources. Notable among these are Khojaipok Ota in the Oltinsoy District, the Sangardak Waterfall and Khonjiza Resort in the Sariosiyo, Khojamaikhona and Shalqon in the Sherabad District, Omonkhona in the Boysun District, as well as Sunbulamozor in the Denov District among many others. Furthermore, the region is home to numerous historical and cultural recreational sites. Some of these, such as the Al-Hakim at-Termizi shrine in Termez, the Kirkkiz fortress, Kokildor Ota, the Fayoztepa Buddhist monastery, the Abu Isa Termizi shrine in Sherabad, the Sufi

Olloyor shrine in the Oltinsoy District and the Dalvarzintepa archaeological monument in the Shurchi District, attract not only local tourists but also visitors from other regions.

Today, significant efforts are being made in our republic to effectively utilize tourist and recreational resources, improve the quality of services provided to tourists, and increase the contribution of tourism to the economy. As we know, the service sector is one of the most profitable sectors, with a large proportion of the population in developed countries employed in this sector. Additionally, the service sector's share of GDP is also substantial. In particular, there is growing interest in natural recreational resources, attracting numerous tourists to these areas. Surkhandarya, rich in both historical-cultural and natural recreational resources, possesses considerable potential for developing this sector. By leveraging existing opportunities and improving infrastructure, the region can attract more tourists and, in turn, increase employment in the sector.

Currently, tourism has been partially established in these areas within the region. However, the sector has yet to reach its full developmental potential. For example, the Sangardak Waterfall, renowned for its lush nature and beautiful waterfall in the Sariosiyo District, draws not only locals but also visitors from various parts of the republic. The number of visitors, particularly in the summer, increases significantly. Despite this, the guest service industry remains underdeveloped. There are no hotels in the area, and while the number of tourists continues to grow each year, most visitors are local tourists, and they typically plan to stay for two to three days. In light of this, establishing home hotels and increasing the number of service facilities will not only contribute to the region's development but also serve as an essential factor in boosting employment.

At present, the infrastructure for home hotels catering to tourists is far from satisfactory. The Sangardak Sanatorium, with a capacity of 200 beds, is unable to accommodate all visitors. Overall, while the region is rich in labor resources and favorable natural conditions, it is crucial to use them efficiently and continue developing the sector to create more employment opportunities.

The economic-geographical location of a region significantly influences its development trajectory and population employment. In this context, the economic-geographical location of Surkhandarya Region cannot be considered favorable. Two main factors contribute to this assessment. First, the region is situated in the southernmost part of the republic, making it distant from the central economic hubs. Second, Surkhandarya borders the Islamic Emirate of Afghanistan, a country that has experienced political instability for many years, which has adversely affected the region's economic-geographical positioning. Despite these challenges, the region's natural resource potential, its abundant labor resources, and the recent stability in Afghanistan's political situation may enhance the favorable aspects of its economic-geographical location.

In addition to assessing the economic-geographical position of the districts of the region, it is also crucial to evaluate the economic-geographical impact of natural conditions and resources on employment. For this purpose, based on the "Scale of Economic-Geographical Assessment of Natural Conditions and Resources", developed by Professor A. Soliyev [*Soliyev*, 2014], the influence of the natural conditions and resources of the region's districts on socio-economic development and population employment indicators was examined (Table 3).

According to this scale, the districts were evaluated based on five indicators. The Denov, Jarkurgan, and Sherabad districts were assessed as strong, while the city of Termez, Bandikhan, and Termez districts were rated lower due to the lack of land, water, and recreational resources, based on the criteria under consideration.

Demographic processes such as birth rates, death rates, age-sex composition, and migration patterns play a significant role in shaping employment formation. According to statistical data, as of January 1, 2025, the population of Surkhandarya Region was 2 945.5 thous. people, ranking seventh in the republic in terms of population size. The region accounts for 7.84 % of the total population of the country. Specifically, the population of Surkhandarya was 1 736.7 thous. in 2000, 1 894.9 thous. in 2005, 2 075.0 thous. in 2010, 2 358.3 thous. in 2015, and 2 945.5 thous. in 2025

(Fig. 1). The analysis indicates that the region's annual population growth rate exceeds the national average. In 2015, the national population grew at an average annual rate of 1.7 %, while Surkhandarya's population grew at 2.1 % per year. By 2025, the average annual growth rates are projected to be 2.0 % for the national population and 2.3 % for the regional population. These differences in population growth rates are closely tied to the socio-economic and demographic development levels of the respective regions [*Tojiyeva*, 2017].

Table 3. Geographical assessment of the impact of natural conditions and resources on the economic and social development of regions

Administrative-territorial units	**Economic geographical location**	**Water resource**	**Land resources**	**Mineral resources**	**Recreation resource**
Surkhandarya Region	+	+++	+++	++	++
Termez City	++	+	+	−	+
Oltinsoy District	+	++	+++	++	++
Angor District	+++	+	++	+	+
Bandikhon District	+	++	+++	−	+
Boysun District	+	+	++	+++	+++
Muzrabot District	++	+	+++	+	+
Denov District	+++	+++	+++	+	+
Jarkurgan District	+++	+	+++	+++	+
Kumkurgan District	+++	++	++	+	+
Kiziriq District	+	+	++	+	+
Sariosiyo District	++	+++	++	++	+++
Termez District	++	+	+	+	+
Uzun District	++	++	+++	+	+++
Sherobod District	+	++	+++	+++	+++
Shurchi District	++	+	++	+	+

Table: Developed by the authors according to the scale of economic geographical assessment of natural conditions and natural resources developed by Prof. A Soliyev
Note: The table shows the following levels of impact: +++ is a strong impact, ++ is a moderate impact, + is a low impact, and − is almost no impact

Based on statistical data, the analysis shows that the high population growth rate in Surkhandarya Region is contributing to an increase in its share of the total population of the republic each year. Specifically, in 2010, the region's population accounted for 7.4 % of the total national population, and this figure is projected to rise to 7.7 % in 2020 and 7.8 % in 2025. These changes are also reflected in the number of labor resources. The analysis suggests that the region's low level of urbanization, the relatively large rural population compared to urban residents, and the high birth rate have significantly impacted the population growth rate. Currently, the urbanization level in the region is 36.1 %, while 73.9 % of the population resides in rural areas. Furthermore, the level of urbanization varies across the region. Among the districts, Angor District (excluding Termez City) has the highest level of urbanization at 48.5 %, while Sariosiyo District has the

lowest at 19.1 % (Table 2). These regional variations in urbanization are closely linked to geographical factors, relief, and other influences.

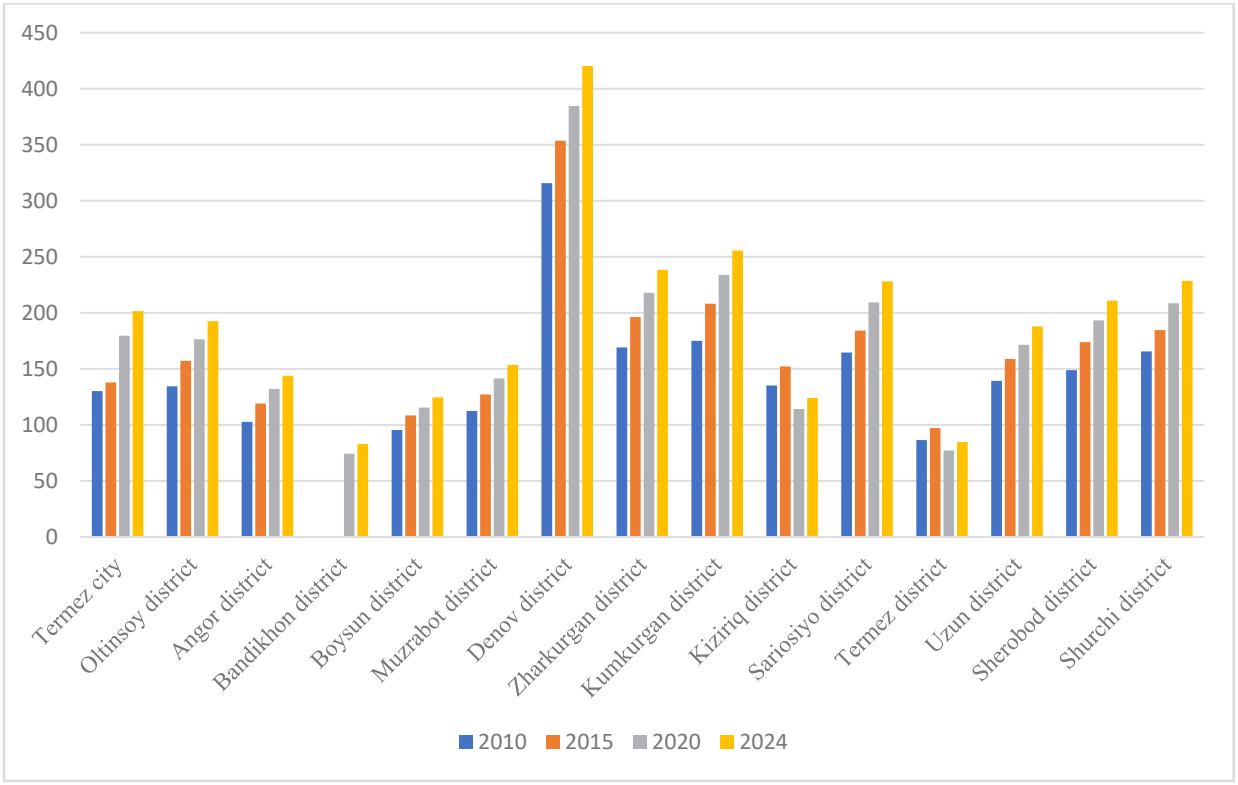

Fig. 1. Population growth in the districts of Surkhandarya Region (2010–2025, thous. people)

Population growth is primarily influenced by birth and death rates. Analyses show that the natural population movement in Surkhandarya Region is among the most active and highest in the Republic. This can primarily be attributed to the high birth rate in the region. Since 1991, many regions of the Republic have experienced a significant decline in natural population increase due to economic challenges linked to the transition to market relations, employment issues, widespread use of contraceptives, an increase in the average age at marriage, and longer intervals between births. However, this trend began somewhat later in Surkhandarya, and despite these broader challenges, the region has maintained a relatively high birth rate compared to other parts of the Republic (Table 1).

After a gradual decline in the birth rate, significant demographic changes occurred in subsequent years, particularly between 2020 and 2024, due to a reversal of the demographic trend. This reversal, marked by a renewed increase in the birth rate, is rarely observed. The birth rate in Surkhandarya Region was 27.0 per mille in 2010, 28.1 per mille in 2020, and 29.2 per mille in 2024. For comparison, the average birth rate in the Republic during these years was 22.0, 24.6, and 24.9 per mille, respectively. In this regard, Surkhandarya Region continues to maintain a leading position in the Republic (Table 1). The birth rate in the region remains high, with almost all districts exhibiting elevated rates. The lowest birth rate in 2024 was recorded in the city of Termez at 25.2 per mille, while the highest was in Bandikhan District, at 31.7 per mille (Fig. 2–3).

Another factor influencing population growth is the mortality rate. As is well-known, the population of the Republic of Uzbekistan has been steadily increasing due to natural growth, with the high birth rate and low mortality rate playing a significant role. It is noteworthy that while the average mortality rate in the republic increased between 2010 and 2020, this indicator has

gradually decreased in the years following 2020. Specifically, the average mortality rate in the republic rose from 4.8 per thousand in 2010 to 5.1 per thous. in 2020, before declining to 4.7 per thous. in 2024. In Surkhandarya Region, the mortality rate followed a similar trend, rising from 4.1 per thous. in 2010 to 4.5 per thous. in 2020, and subsequently decreasing to 4.3 per thousand by 2024. This decrease can primarily be attributed to the increase in the birth rate (Table 4). The analysis also shows that in all districts of the region, except for Termez, the mortality rate is lower than the national average. The higher rate in Termez district can be attributed to the migration of young families to the city. In general, the population of the region is growing naturally at a rate of 25.1 per thousand per year.

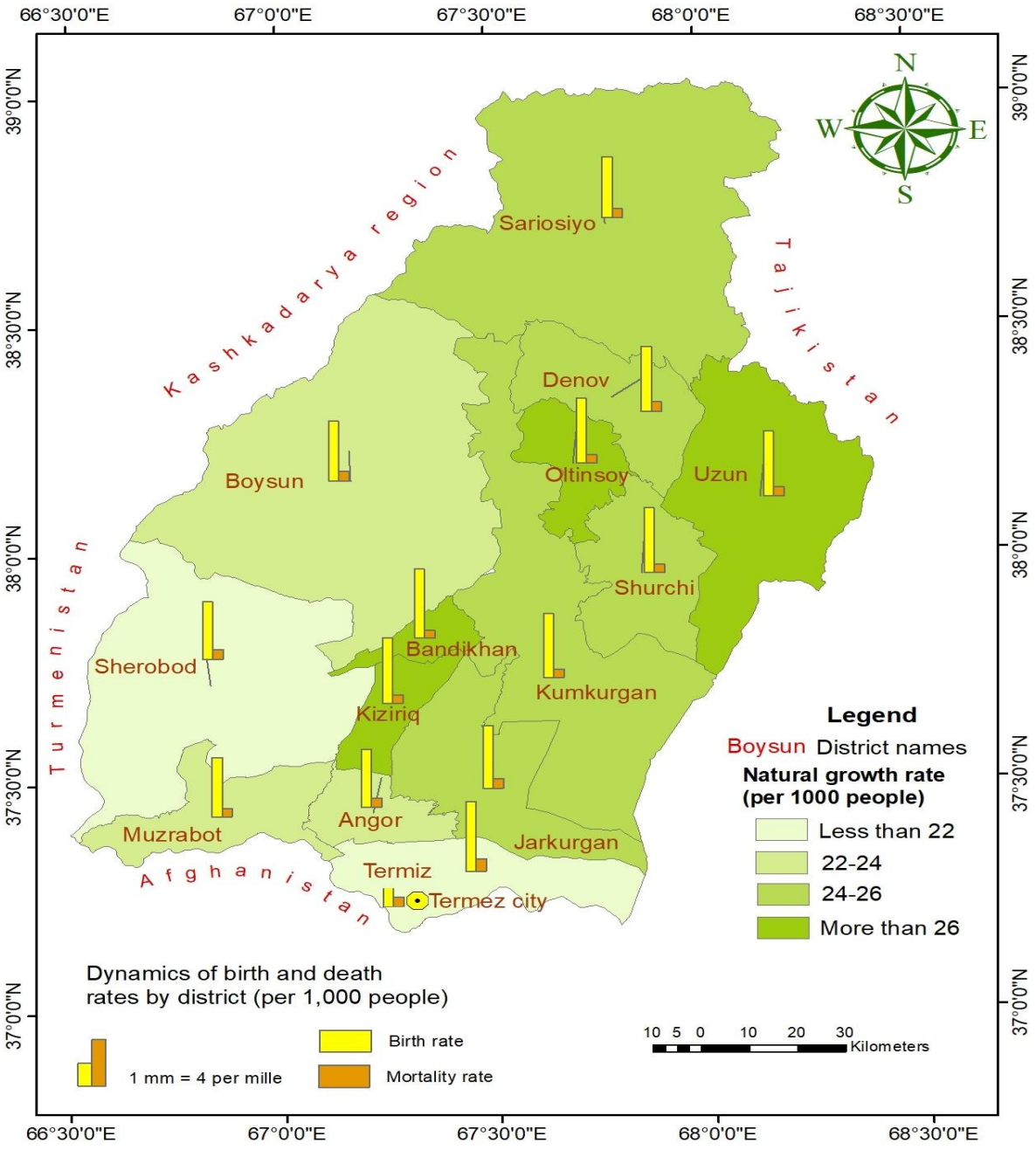

Fig. 2. Map of natural movement of the population of Surkhandarya Region

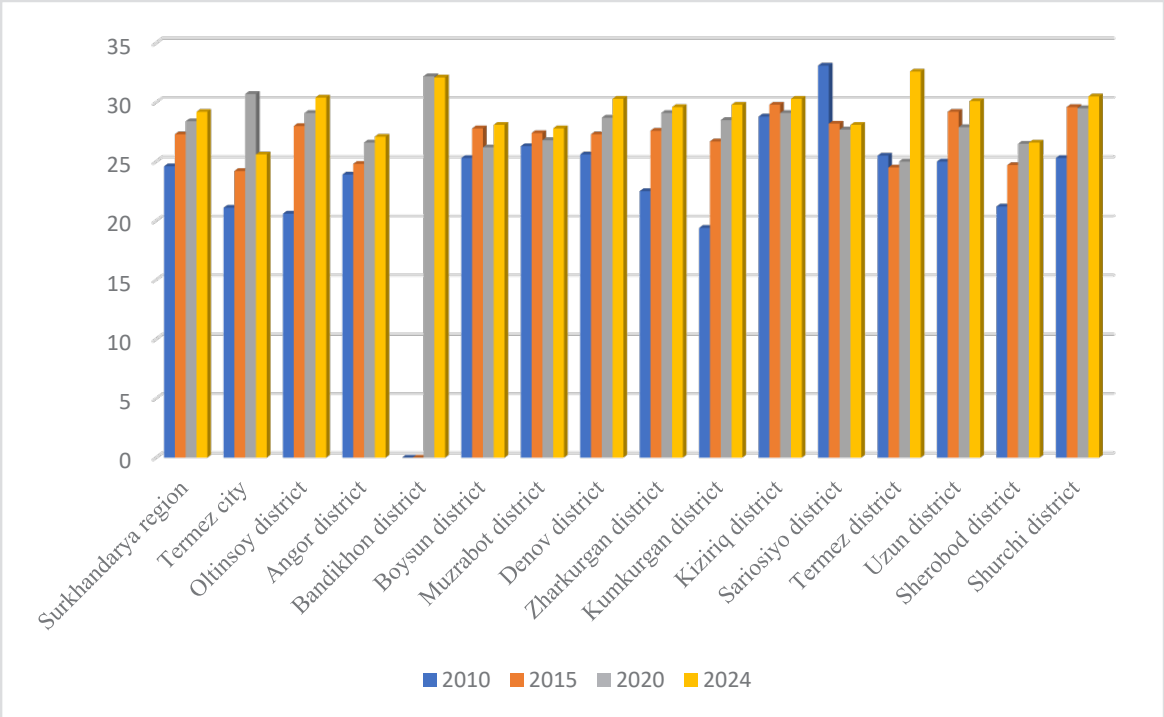

Fig. 3. Total fertility rate of the population in the districts of Surkhandarya Region (2010–2025, in per thousand)

Table 4. Changes in the number of deaths among the population of Surkhandarya Region (number of deaths in the numerator — people, the share of deaths in the denominator — in percentage; the city of Termez is calculated together)

Administrative-territorial units	2010	2015	2020	2024	2024 compared to 2010 (%)
Oltinsoy District	530 3.8	602 3.8	660 3.7	781 4.0	147.3 –
Angor District	459 4.3	557 4.6	643 4.8	636 4.3	138.5 –
Bandikhon District	0 0	0 0	280 3.7	306 3.6	– –
Boysun District	431 4.4	477 4.3	491 4.2	576 4.5	133.6 –
Muzrabot District	416 3.6	522 4.1	614 4.3	638 4.1	153.3 –
Denov District	1 336 4.2	1 497 4.2	1 730 4.5	1 842 4.3	137.8 –
Jarkurgan District	633 3.6	875 4.4	1 068 4.9	1 142 4.7	180.4 –

Administrative-territorial units	2010	2015	2020	2024	2024 compared to 2010 (%)
Kumkurgan District	633 3.5	800 3.8	1 019 4.3	1 074 4.1	169.6 –
Kizirik District	471 3.4	577 3.7	499 4.3	512 4.0	108.7 –
Sariosiyo District	607 3.6	687 3.7	770 3.6	930 3.0	153.2 –
Termez District	393 4.5	469 4.8	490 6.3	512 5.9	130.2 –
Uzun District	665 4.7	577 3.6	687 4.0	761 4.0	114.4 –
Sherobod District	576 3.7	728 4.1	948 4.9	1 011 4.7	175.5 –
Shurchi District	710 4.2	805 4.3	1 036 4.9	969 4.1	136.4 –
Termez City	586 4.4	714 5.1	996 5.5	931 4.5	158.8 –
Surkhandarya Region	8 446 4.0	9 887 4.1	11 931 4.5	12 621 4.3	149.4 –

The table was compiled by the authors based on data from the National Statistics Committee of the Republic of Uzbekistan

According to statistics, in 2024, 10839 people migrated to Surkhandarya Region, while 13 857 people emigrated. Between 2010 and 2024, the number of immigrants decreased from 11 600 to 10 839, reflecting a 6.6 % decline. Conversely, the number of emigrants increased from 12 742 to 13 857 during the same period. The region's net migration in 2024 was −3 008 people. The difference between the natural and mechanical population movement is substantial, and migration plays a notable role in the impact of demographic factors on employment. In recent years, the number of migrants has been rising, with the majority migrating in search of employment. From this perspective, employment plays a significant role in shaping migration trends. By improving employment opportunities, it would be possible to reverse the migration balance and achieve a positive net migration in the region.

Demographic processes lead to changes in the number of labor resources, which in turn affects employment. According to 2023 data, the number of labor resources in Surkhandarya Region is 1 489.6 thous. people, representing 53.6 % of the region's total population (Fig. 4). Among the districts, Denov ranks first with approximately 210 thous. people, while Bandikhon ranks last with the fewest labor resources, totaling 36.2 thous. people. This indicates a significant internal disparity within the region, with a geographical coefficient of 5.8 times. The region's natural population growth, which exceeds that of the republic, results in an annual increase in the number of people entering the labor market. This highlights the importance of efficiently utilizing natural resources and rapidly expanding existing employment opportunities through a comprehensive analysis of geographical, demographic and social factors.

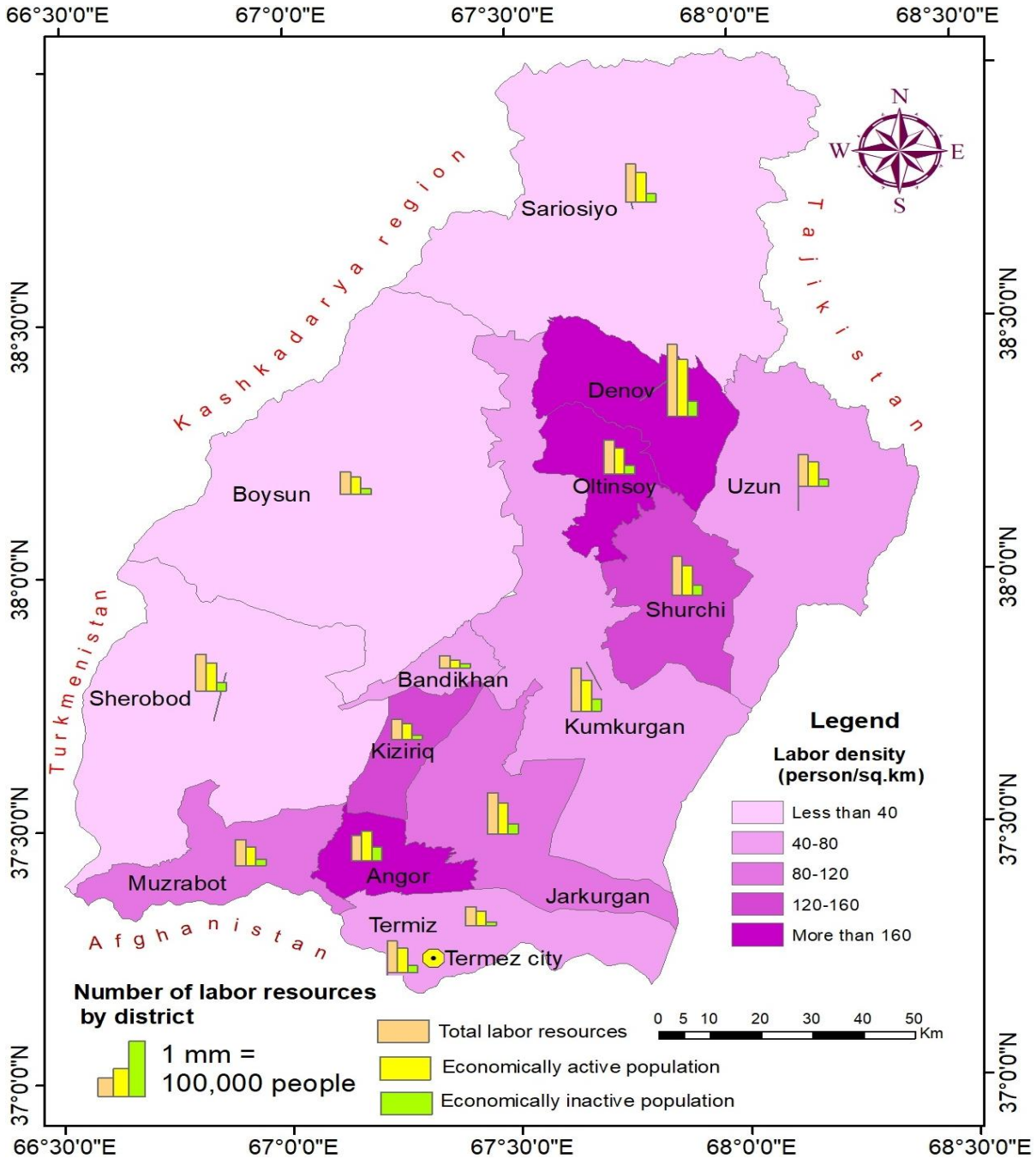

Fig. 4. Surkhandarya Region labor resource map

CONCLUSIONS

In conclusion, the findings of the study demonstrate that Surkhandarya Region, located in the southern part of Uzbekistan, stands out from other regions of the republic due to its unique geographical location, natural conditions, resources, and significant demographic potential. The study has thoroughly examined the natural, geographical, and demographic factors influencing employment in the region, which is characterized by a high natural population growth rate. These geographical factors were assessed using the geographical assessment scale of natural conditions and resources' impact on the economic and social development of the region. Furthermore, territorial and temporal variations in demographic processes were analyzed using Geographic Information System (GIS) technologies. The key demographic processes, including fluctua-

tions in birth and death rates, their underlying causes, and their effects on regional employment, were also explored.

Based on the findings, it can be concluded that Surkhandarya Region is endowed with abundant natural and labor resources, offering significant potential for increasing employment. The region possesses numerous mineral deposits and rich recreational resources. However, the analysis indicates that these resources are currently underutilized. A large proportion of the population remains employed in agriculture. Yet, experiences from developed countries suggest that the focus should not solely be on increasing agricultural employment, but rather on expanding employment in the production and service sectors. Furthermore, the continuous influx of people into the labor market each year underscores the need to address migration-related issues within the region. Given that industrial sectors, beyond the light and food industries, are underdeveloped, and the region's resource potential remains largely untapped, there exists considerable opportunity for the growth of industry and services. Increasing the share of the employed population in these sectors depends largely on the development and organization of these industries.

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