

MOTIVATION FACTORS OF INTERNAL MIGRATION AND AGRICULTURE IN AZERBAIJAN

Rashad H. Bagirov

Western Caspian University, Azerbaijan

Yusif A. Humbatov

University of Technology of Azerbaijan (UTECA), Azerbaijan

Rufat J. Efendiyev

Socio-Economic Research Center, Baku, Azerbaijan

Irada S. Mehdiyeva

Azerbaijan State University of Economics (UNEC), Azerbaijan

Naila I. Sultanova

Azerbaijan State University of Economics (UNEC), Azerbaijan

ABSTRACT

With increasing non-constructive urbanization in Azerbaijan, there is a need to study the features of internal migration in the country. This study aims to identify the fundamental factors that underlie internal migration in the country's agriculture sector. A survey of 3498 agricultural workers from regions in Azerbaijan and the probit-model method have been used to group the factors that determine internal migration activity in this industry. The most significant factor in deciding on migration is the ratio of individual human capital development to the region's standard of living. Complementary factors of a directly proportional impact on internal migration in agriculture, in order of priority, are personal and professional mobility, infrastructural development of the region, and development of healthcare and education in the area. The study's results can help improve the effectiveness of the country's agricultural development strategy and urbanization management.

Keywords: internal migration, agriculture, Azerbaijan, urbanization, management, human capital.

DOI: <http://dx.doi.org/10.15549/jeecar.v9i4.1109>

INTRODUCTION

The spread of the COVID19 pandemic and the deterioration of climatic conditions as early as 2020 have provoked the rupture of numerous

logistics and food chains on a global scale, mass business closures, a significant slowdown in labor migration, and an increase in the tendency to accumulate food in many countries around the

world. These trends have become prerequisites for a global food crisis, the unprecedented scale of which is exacerbated by the war in Ukraine and Russian aggression. For 2020-2022, the number of people faced with food shortages has almost tripled, reaching 345 million living in 82 countries (World Food Programme, 2022). The cost of agricultural raw materials in 2021 reached a high over the past ten years, and in May 2022, food price inflation over May 2021 was almost 23% (Agriculture and Horticulture Development Board, 2022).

By the end of 2022, the war in Ukraine could trigger a full-blown food crisis that will lead to poverty, want, and hunger in the world's poorest countries. At the same time, according to numerous estimates by leading experts, given the current trends in the military conflict, the food crisis may only worsen against the backdrop of a reduction in agricultural raw materials, food supply, and rising food prices (Deutsche Welle, 2022).

Azerbaijan also has faced inflation in imported food due to the Russian war in Ukraine. The government is actively taking measures to protect the domestic food market by introducing export quotas, customs preferences, and other mechanisms to support the Azerbaijani agrarian sector (Deloitte, 2022). Due to the food crisis, which is progressing on a global scale and carries not only the risk of inflation, but the destruction of logistics supply chains, protectionist measures only cannot provide an anti-inflationary effect. Therefore, an urgent increase in agricultural production and processing of agro-industrial products, the technological development of the farming industry, and its digitalization are put on the agenda to stabilize the domestic market and ensure the country's food security (Valiyev et al., 2022; Gulaliyev et al., 2019).

In Azerbaijan, agriculture again takes the lead in stabilization over the destructive impact of external shocks on the economy. In recent years, due to the substantial volatility of oil prices, the country's government has focused on strengthening the diversification of the national economy. Azerbaijan's non-oil exports in 2021 amounted to a record \$2.7 billion, which was 47.2% more than in 2020 (Trend, 2022). According to forecasts by the Ministry of Economy of Azerbaijan, by 2025, the share of the non-oil sector in the country's GDP will be 72.9% (Interfax, 2022). Agriculture is one of the drivers

of economic diversification, which at the beginning of 2022 amounted to almost 7% of the country's GDP (State Statistical Committee, 2022).

In the context of ensuring food security and reducing dependence on oil, it seems necessary to increase the potential of agriculture. One of the main problems in this is urbanization and a sharp differentiation in the development of regions in the country. Azerbaijan ranks first in the world in terms of internal labor migration. Suppose that about 98% of the migration flow in other countries is made up of citizens of different states than in Azerbaijan. In that case, more than 90% of migration is internally displaced (International Centre for Migration Policy Development, 2018). Azerbaijan is an agricultural country; almost 47% of the population lives in rural areas, while 36% is employed in agriculture (State Statistical Committee, 2022). These are primarily people of middle, elderly and senile age. Given the difficult economic conditions of the regions of the country, young people, as well as residents of different age categories of people from the occupied and non-occupied territories of Azerbaijan, are massively moving to live in Baku.

The population density of the capital has more than doubled in the last 30 years. The number of the rural population of Azerbaijan has not increased over the past 40 years, but the entire natural increase falls on the share of Baku (Poliqon, 2019). This indicates that urbanization has become a severe problem and is a significant destructive factor for building up the potential of agriculture, especially concerning the industrialization of the industry. A low level of industrialization characterizes the industry's productivity due to the production process's high share of manual labor. At the same time, internal migration in Azerbaijan has not been regulated (about 35-40% of the country's population is not registered at their place of residence), further exacerbating the problem (International Centre for Migration Policy Development, 2018).

Many scientists argue that urbanization can be slowed down not only through such economic preferences in agriculture as wage increases, preferential industry taxation, etc. but also through the social development of the regions (Kasych & Vochozka, 2019; Jiang, Zhou & Qiu, 2022). In Azerbaijan in recent years, despite the large number of funds allocated by the state for

the socio-economic development of the regions (mainly these funds were directed to the improvement and reconstruction of the visible parts of the regional centers), the problem has not yet been resolved. But the digitalization and import substitution of agricultural products is seen as a priority for the development of agriculture in Azerbaijan, and the solution to the problem of internal migration should be the basis of the country's strategic development. The scientific priority of this study is to empirically assess the factors that determine internal migration in Azerbaijan agriculture under current conditions; to identify the dominant factors and substantiation of the priorities of the internal migration management strategy in the country.

LITERATURE REVIEW

Scholars in a wide range of disciplines have considered migration processes. In particular, the impact of migration flows on the host country's economy was studied according to various criteria of migrants: gender, professional skills, life priorities, mentality, etc. (Bayramov et al., 2021). More and more scholars are concluding that migration has a complementary effect on economic growth, improving the quality of human capital and labor productivity in host countries. The positive impact is especially pronounced in developed market economies (Bhavnani & Lacina, 2017). The situation is also improving in the homeland of emigrants, who usually support their relatives with money transfers (Rufai et al., 2019). Scheduled, regular, and safe migration has been set up at the heart of the 2030 Agenda for Sustainable Development (United Nations, 2022).

There is also an opposing point of view. Such scholars as Přívara (2021) and Ozekicioglu (2019) argued that migration increases unemployment and decreases the GDP of the host country, increases economic crimes and the shadow economy, increases the economic burden on social infrastructure, deepening of the differentiation of the population in terms of income, and so on.

Internal migration of citizens involves voluntary or forced citizens within the country of residence. Internal migration impacts positive and negative impacts on host regions and areas of origin (Bhavnani & Lacina, 2017; Ozekicioglu,

2019).

Within internal migration, one of the most discussed issues is urbanization. As a rule, the largest share of the population moves to search for a better life from rural to urban areas (International Organization for Migration, 2017). For the agricultural industry, this threatens the supply of labor.

Sadiddin et al. (2019) emphasized that food availability is a fundamental motive for agricultural migration activity. In regions where food is scarce, migration can reduce pressure on the area's food security, and in other parts, it can improve it through the influx of additional labor. Few scientific papers have substantiated that migration reduces food availability in host regions (World Food Programme, 2017).

Scholars such as Tong and Lo (2021) justified the economic opportunities of rural areas as a priority motive for migration activity. Unemployment, lack of social guarantees and protection, heavy manual labor, depletion of natural resources, and other factors of economic futility force people to leave their homes and move to economically advantageous regions or cities. Rural poverty threatens unconstructive urbanization and the extinction of entire agricultural areas. It threatens by the desolation of unplowed lands, the degradation of agricultural labor resources, the reduction of agricultural raw materials and food, animal husbandry, and so on (Busso, Chauvin & Herrera, 2021).

Azerbaijani scholars have supported this point of view. Although internal migration reflects the development and structural changes process, improving the family's quality of life and well-being is the choice of moving people within the country (Yüksel et al., 2018).

Sinclair et al. (2019) identified gender discrimination in rural areas as a critical factor in internal agricultural migration. Men are more prone to internal migration since they are mainly entrusted with the primary responsibility for ensuring the family's well-being. Such stereotypes as "the inability of women to hold certain positions in agriculture" cause irreparable damage to the productivity of the agro-industrial complex and provoke agricultural migration.

Shayegh, Emmerling, and Tavoni (2022) justified the spread of disease as a driver of internal population mobility between rural areas

and uncontrolled urbanization. Climate change and environmental degradation risk the spread of numerous diseases for humans, animals, and plants. Considering the health care system, its organization and quality in urban areas are higher than in rural areas, encouraging many people to relocate to get better health care and insurance. But on the other hand, spreading the COVID-19 pandemic suggests that this factor can also slow down internal migration, which has both a positive and a negative impact on agricultural development (Kokubun, 2022; Megits, Neskorodieva & Schuster, 2020). Also, diseases can spread to the crop and livestock sectors of agriculture. This causes irreparable damage to the agro-industrial complex's economy, pushing people to search for better working conditions (Shayegh, Emmerling & Tavoni, 2022).

Thus, the causes of internal agricultural migration and its impact on the industry are complex and depend on many factors. It can have long-term consequences both for the receiving areas and the origin regions of internal emigrants in terms of agricultural productivity and other capacities, food security, regional economies, and so on. Therefore, it is advisable to investigate these issues for each specific country, region, and city. Studying the factors that motivate agricultural migration in Azerbaijan will make it possible to specify the basis for developing an effective agricultural and digitalization strategy.

METHODOLOGY

The data source for the study of migration was a survey conducted in January-June 2022 among those employed in agriculture in all economic regions in Azerbaijan. The sample has been created with representatives of the industry's agricultural and service professions: machinists, IT specialists, economists, and lawyers.

Excluded from the sample of respondents were:

- 1) persons working for themselves (relatives, friends);
- 2) persons migrating because of the cordon;
- 3) persons migrating to other economic regions to their acquaintances, relatives, or to the areas where they have their real estate;
- 4) persons migrating to other regions who have switched to agriculture from different sectors of

the economy.

The size of the sample that satisfied these restrictions was 3498 people. Of these, 595 people have migrated at least once within the country over the past ten years, and 2903 people have never migrated.

The number of respondents, their belonging to all economic regions of Azerbaijan, voluntary participation in the survey, and anonymity testify to the representativeness of the survey results.

The questionnaire questions reflected the specific indicator which could affect the migratory moods of the respondents. The list of indicators was based on (Yüksel et al., 2018; Shayegh, Emmerling & Tavoni, 2022; Kokubun, 2022; Sadiddin et al., 2019) (Table 1)

According to the methodology (Human Development Index, 2022), we assessed human capital using the level of education, knowledge, skills, health, and standard of living. In this study, the standard of living we considered was a different factor due to its priority impact on migration, according to most studies (Sadiddin et al., 2019; Yüksel et al., 2018; Kokubun, 2022). (The effect of human capital on migration has been mentioned, but not a lot (Shayegh, Emmerling & Tavoni, 2022)). We assessed factors of infrastructural, ecological, and cultural development of the region, development of education, healthcare, and climatic conditions, accounting for the area in which the respondent lives.

For questions about higher education (High) and academic degree (Deg), respondents needed to answer "Yes" or "No." The option "Yes" was estimated at "5" points, and "No" at "1". The values of other indicators (Table 1) have been determined based on respondents' ratings in the range from "1" to "5". The higher the score, the more important the indicator. The factor's values (independent variable) were calculated as the arithmetic mean values of the indicators that formed this factor. The dependent variable was the value of migration activity (Migr). This variable takes the value "1" if the respondent has migrated within the country at least once over the past ten years and "0" if the respondent has not relocated.

Table 1: Indicators affecting internal labor migration in agriculture in Azerbaijan

<i>Factors</i>	<i>Indicators</i>
Respondent's mobility (<i>Persmob</i>)	Social activity (<i>Activ</i>) Adaptability to changing living conditions (<i>Adapt</i>) Flexibility (<i>Flex</i>) Energy (<i>Ener</i>) Initiative (<i>Init</i>)
Respondent's professional mobility (<i>Profmob</i>)	Adaptability to changing working conditions (<i>Adaptwork</i>) Mastering new ways of working (<i>New</i>) Frequent job changes (<i>Chanjob</i>) Frequent career changes (<i>Chanprof</i>) Ability to find a job when needed (<i>Work</i>)
The human capital level of the respondent (<i>HC</i>)	Higher education (<i>High</i>) Ph.D. (<i>Deg</i>) Skills of self-improvement, personal and professional self-development (<i>Self</i>) Professionalism (<i>Profes</i>) Work experience sufficient to perform competencies (<i>Exper</i>) Good health (<i>Health</i>)
Respondent's standard of living (<i>Liv</i>)	Wage Satisfaction (<i>Wag</i>) Satisfaction with social package (<i>Soc</i>) Additional income opportunity (<i>Inc</i>) Satisfaction with one's financial situation (<i>Standliv</i>) Satisfaction with living conditions (<i>Cond</i>)
Infrastructural development of the region (<i>Inf</i>)	Availability of necessary government institutions in the region (<i>Gov</i>) Service Industry Development (<i>Serv</i>) Convenient transport interchange (<i>Transp</i>) Availability of shopping and entertainment centers (<i>Shop</i>) Availability of recreational water (<i>Wat</i>)
Ecological development of the region (<i>Ecol</i>)	Fresh air (<i>Air</i>) Green spaces, forests, and forest parks (<i>Green</i>) Lack of extensive industrial facilities (<i>Ind</i>) Absence of pollution in the region (<i>Risk</i>) Far from transport roads (<i>Tr</i>)
The cultural development of the region (<i>Cult</i>)	Recreation parks in the area (<i>Park</i>) Theaters, cinemas (<i>Theat</i>) Libraries (<i>Libr</i>) Cultural and educational centers (<i>Cent</i>) Physical development centers, sports sections, sports grounds (<i>Sport</i>)
Development of education in the region (<i>Edu</i>)	Higher education institutions (<i>Instit</i>) Best educational institutions (<i>Prest</i>) Vast network of schools (<i>School</i>) Vast network of kindergartens (<i>Kind</i>)
Development of healthcare in the region (<i>Heal</i>)	Vast network of hospitals (<i>Hosp</i>) Vast network of pharmacies (<i>Pharm</i>) High quality, prompt medical care (<i>Qual</i>) Affordability of health care (<i>Fin</i>)
Climatic conditions (<i>Clim</i>)	Comfortable temperature, precipitation level (<i>Temp</i>) No strong winds (<i>Wind</i>) Comfort Relief (<i>Rel</i>)

Source: Authors' finding

Due to the binary nature of the dependent variable and the normal distribution of independent variables, we used the probit model to estimate internal migration in the agricultural sector (Formula 1).

$$\begin{cases} P_i = P(Migr = 1|F_i) \\ F_i = \{Persmob, Profmob, HC, Liv, Inf, Ecol, Cult, Edu, Heal, Clim\} \end{cases} \quad (1)$$

Where P_i – the probability that the indicator of migratory activity takes on the value «1»;

$Migr$ – migration activity;

F_i – factor influencing migration activity;

$Persmob$ – respondent's mobility;

$Profmob$ – respondent's professional mobility;

HC – the human capital level of the respondent;

Liv – respondent's standard of living;

Inf – infrastructural development of the region;

$Ecol$ – ecological development of the region;

$Cult$ – the cultural development of the region;

Edu – development of education in the region;

$Heal$ – development of healthcare in the region;

$Clim$ – climatic conditions

We used the Statistica 12 program and Deductor Studio Academic 5.3. to determine migration factors and the decision tree method to prioritize them.

RESULTS

The statistical assessment of the factors' impact on labor migration in agriculture is presented in Table. 2.

Table 2: Models for assessing the impact of factors on internal labor migration in agriculture

Independent variables	Coefficients for variables			
	Model (1)	Model (2)	Model (3)	Model (4)
<i>Persmob</i>	0.44***	0.42***	0.42***	0.48***
<i>Profmob</i>	-0.37***	-0.30***	-0.35***	-0.38***
<i>HC</i>	0.11*	-	-	-
<i>Liv</i>	-0.22**	-	-	-
<i>Inf</i>	-0.09*	-0.09*	-0.12*	-0.13*
<i>Ecol</i>	-0.02	-0.02	-0.05	-
<i>Cult</i>	-0.03	-0.02	-0.06	-
<i>Edu</i>	-0.07*	-0.06	-0.09*	-0.10*
<i>Heal</i>	-0.08*	-0.07*	-0.10*	-0.12*
<i>Clim</i>	-0.01	-0.01	-0.01	-
<i>(HC×Liv)</i>	-	-0.11*	-	-
<i>(HC/Liv)</i>	-	-	1.02***	1.06***
<i>Constant</i>	0.94	1.04	0.16	-0.26
<i>p-value</i>	0.0441	0.0284	0.0013	0.0001

* - Statistical significance of the factor at the level 0.1, ** - at the level 0.05, *** - at the level 0.01

Source: Authors' finding

A correlation matrix between migration factors (Table 3) testifies to a statistically significant relationship between the human capital development factor and the standard of living.

Table 3: Values of correlation coefficients between factors of internal labor migration in the agricultural.

	<i>Persmob</i>	<i>Profmob</i>	<i>HC</i>	<i>Liv</i>	<i>Inf</i>	<i>Ecol</i>	<i>Cult</i>	<i>Edu</i>	<i>Heal</i>	<i>Clim</i>
<i>Persmob</i>	1	-	-	-	-	-	-	-	-	-
<i>Profmob</i>	0.02	1	-	-	-	-	-	-	-	-
<i>HC</i>	0.02	0.03	1	-	-	-	-	-	-	-
<i>Liv</i>	0.03	0.02	0.19***	1	-	-	-	-	-	-
<i>Inf</i>	0.00	0.00	0.01	0.01	1	-	-	-	-	-
<i>Ecol</i>	0.00	0.00	0.00	0.01	0.01	1	-	-	-	-
<i>Cult</i>	0.00	0.00	0.00	0.01	0.01	0.00	1	-	-	-
<i>Edu</i>	0.01	0.00	0.02	0.03	0.01	0.00	0.02	1	-	-
<i>Heal</i>	0.01	0.00	0.01	0.02	0.01	0.00	0.00	0.02	1	-
<i>Clim</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1

*** - Statistical significance of a correlation coefficient at the level of 0.01

Source: Authors' finding

The multicollinearity of the Model reduces its adequacy. Therefore, it became necessary to exclude one of the correlated factors from the Model, but banning a statistically significant factor would lead to a decrease in the information content of the Model. In this regard, for models (2) and (3) (Table 2), we used the ratio of factors of human capital and standard of living.

The ratio of individual human capital to income level has a more significant impact on migration (elasticity coefficient 4.45) than the product of these factors (elasticity coefficient of migration activity from the factor of development of individual human capital 1.38, from the standard of living factor |3.67|). The ratio of human capital to income level has been determined as a factor in the fair valuation of human capital. Its influence on migratory activity is significant at a

significance level of 0.01.

We calculated Model (4) to exclude variables that do not have a statistically significant effect on migration activity. This Model is the most adequate and statistically significant, with a significance level of 0.0001, so it is used to build the decision tree.

The constructed Model (4) and the decision tree (Fig. 1) show that the main factor stimulating migration is the discrepancy between individual human capital and material reward levels.

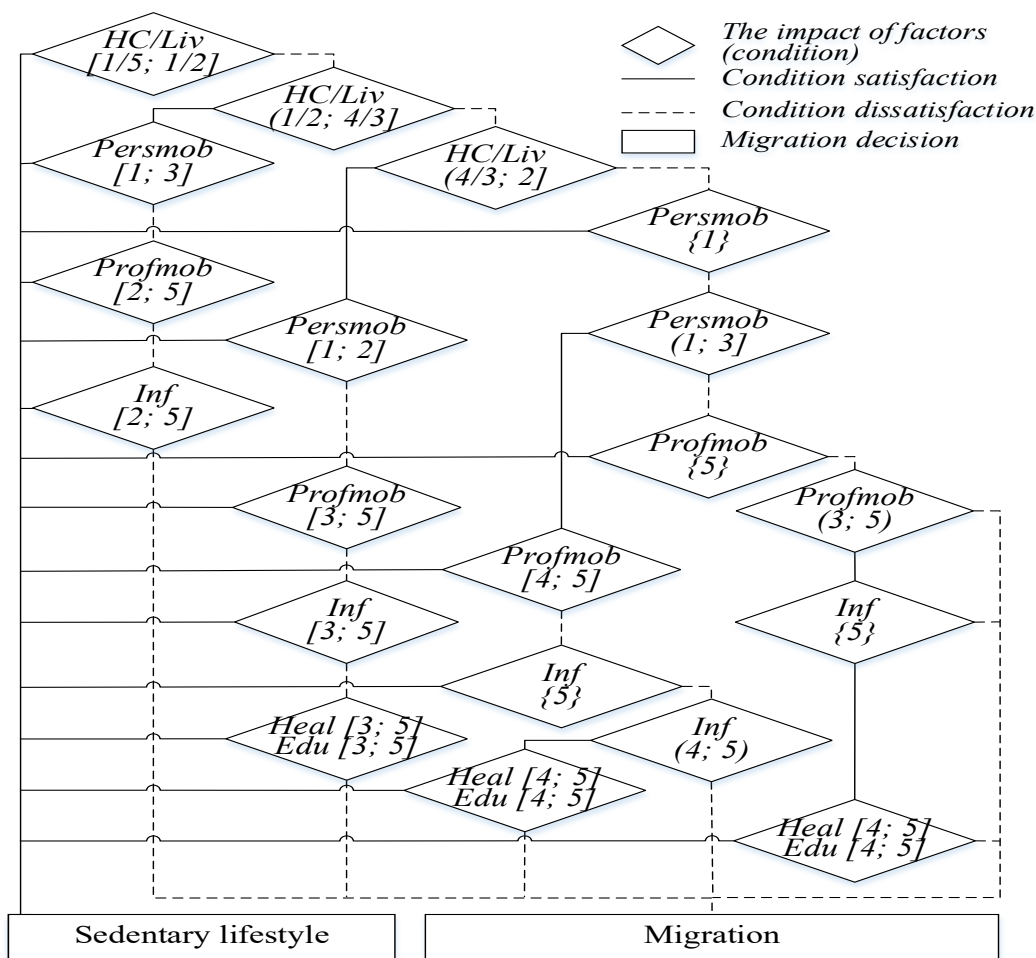


Figure 1: Decision tree of priority of factors influencing migration activity in agriculture

The adequacy of the constructed decision tree was confirmed using a confidence indicator; the value for each classification rule is not lower than 93%.

DISCUSSION

We have shown that personal mobility (the psychological readiness to change - adaptability to new conditions, flexibility, vigor, initiative, and activity that stimulate the search for better working and living conditions) affects the decision to migrate. The influence of another factor of mobility, professional mobility, is also significant. But, unlike personal mobility, a higher level of development of professional mobility reduces migration activity. Increasing adaptability to changing working conditions, mastering new working methods, finding a new job, and changing professions make it possible to satisfy the needs of an employee without changing their place of residence.

As in other studies (Sadiddin et al., 2019; Yüksel et al., 2018; Kokubun, 2022), we empirically confirmed that one of the decisive factors determining the need to migrate is the standard of living of a worker. The influence of this factor on migratory activity is statistically significant at a significance level of 0.05. A higher standard of living - higher wages, other incomes, and better housing conditions - does not cause the need to migrate to other regions.

Among the factors influencing internal labor migration in the agricultural sector of Azerbaijan is the development of human capital and infrastructural development of the region and the growth of education and healthcare in the area. The influence of these factors is significant at a significance level of 0.1. A worker with a higher level of human capital expects higher wages, which, if not matched, leads to a search for a new higher-paid job that more economically developed regions are ready to offer or to a search for more comfortable working

and living conditions. Education, good health, and professionalism increase the demand for such a worker and provide him with variability in the choice of places of work and residence.

Regions with developed infrastructure, education, and healthcare systems contribute to more comfortable living conditions and an unwillingness to migrate.

The influence of ecological, cultural, and climatic factors on migration in the agricultural sector of Azerbaijan is not statistically significant, in contrast to the scientific results that Kokubun (2022) reported.

The underestimation of workers is a necessary but not sufficient condition for migration. An additional requirement for migration is personal mobility. The maximum dissatisfaction with the standard of living with a high level of human capital development cannot force an employee to migrate if his mobility is at a minimum level ("1" point, according to our result). This factor within the framework of agricultural migration has not been appropriately studied. (Shayegh, Emmerling & Tavoni, 2022).

The next factor influencing the decision to migrate is the infrastructural development of the region, which partially compensates for the low level of professional mobility. Factors in the region's development of education and healthcare are the last to influence the decision to migrate.

CONCLUSION

Empirically, using the example of agriculture in Azerbaijan, we have substantiated the priority influence of the development ratio of individual human capital and the potential standard of living. That is, the higher the development of personal human capital and the level of development of agriculture in a given region, the greater are opportunities to provide an employee with all the necessary material goods and services, and the lower the level of internal migration. And vice versa: the higher the difference between the level of development of individual human capital and the standard of living in the region, the more intense the agricultural migration. Despite its highest priority, dissatisfaction with the standard of living at the current level of human capital development is not a sufficient condition for migration.

The decision to migrate also depends on personal and professional mobility, which has a diverse impact on migration activity. But a higher level of personal mobility development provokes an increase in the willingness to relocate. The decision to migrate in this case depends on professional mobility, which can compensate for dissatisfaction with living conditions and psychological readiness to migrate.

Thus, an effective strategy for managing internal migration in Azerbaijan should be based on the modernization of agriculture based on advanced training of workers, consisting of the establishment of various educational courses, professional mobility programs, and training. These will increase the value added in the industry and thus increase wages. However, these processes must be sustainable and meet the requirements of modern trends in developing the economy, agriculture, and human capital.

Our study was carried out on a sample of indicators characterizing the internal migration of agriculture in a particular country. Therefore, we can apply the results only to Azerbaijan and its entire agro-industrial complex. Agriculture, though, has many branches of specialization, including animal husbandry, crop production, seed production, and so on. These sectors have their own characteristics of internal migration and working conditions and therefore require a separate fundamental study. These issues will be the subject of our future research work.

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ABOUT THE AUTHORS

Rashad H. Bagirov, e-mail: rashad@wcu.edu.az

Rashad H. Bagirov, Vice-rector of the Western Caspian University, Azerbaijan.

Yusif A. Humbatov, the University of Technology of Azerbaijan (UTECA), Azerbaijan, Ph.D. in Economics.

Rufat J. Efendiyev, Socio-Economic Research Center, Baku, Azerbaijan, Ph.D. in Economics.

Irada S. Mehdiyeva, Azerbaijan State University of Economics (UNEC), Azerbaijan, Ph.D. in Economics.

Naila I. Sultanova, Azerbaijan State University of Economics (UNEC), Azerbaijan.