

Demographic Security and Sustainable Development of Ukraine in the Conditions of Active Migration of the Population

Bezpieczeństwo demograficzne i zrównoważony rozwój Ukrainy w warunkach aktywnej migracji ludności

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Abstract

The article examines the impact of migratory processes on the demographic security of Ukraine in the context of active external and internal migration caused by a full-scale war by Russia. To achieve this goal, statistical, economic and mathematical methods were used, in particular, correlation and regression analysis to assess the impact of migratory factors on demographic indicators; comparative methods of analyzing migration processes in Ukraine and countries where Ukrainians seek asylum. Key demographic challenges were analyzed, in particular, the decline in the birth rate, high mortality among the military and civilian population, as well as mass emigration of young people and the working-age population. It is emphasized, that growing emigration leads to a demographic hole that threatens the economic stability and social structure of the country. The relationship between the unemployment rate, wages and migratory flows was studied, and the experience of European countries in attracting and integrating migrants was analyzed. Attention is focused on the relationship between the demographic situation and the Sustainable Development Goals. In particular, the challenges associated with SDG 3 (Good health and well-being), SDG 8 (Decent work and economic growth), SDG 10 (Reduced inequality) and SDG 11 (Sustainable urban and community development) are examined. Mass migration changes the gender balance in the country, exacerbates the problem of population aging and affects labour resources, which complicates the achievement of social equality and economic stability. A model of the impact of migration processes on the demographic development of Ukraine and strategic measures to minimize negative consequences are proposed. The importance of integrating the principles of sustainable development into state policy is emphasized to preserve human capital and restore the country's demographic potential.

Key words: migration, demographic development, sustainable development, human capital, Sustainable Development Goals, economic stability

Streszczenie

W artykule zbadano wpływ procesów migracyjnych na bezpieczeństwo demograficzne Ukrainy w warunkach aktywnej migracji zewnętrznej i wewnętrznej spowodowanej wojną na pełną skalę ze strony Rosji. Aby osiągnąć cel, wykorzystano metody statystyczne, ekonomiczne i matematyczne, w szczególności analizę korelacji i regresji do oceny wpływu czynników migracyjnych na wskaźniki demograficzne; porównawcze metody analizy procesów migracyjnych w Ukrainie i w krajach, w których Ukraińcy ubiegają się o azyl. Analizie poddano kluczowe wyzwania demograficzne, do których zalicza się spadek liczby urodzeń, wysoką śmiertelność wśród ludności wojskowej i cywilnej, a także masową emigrację młodzieży i ludności w wieku produkcyjnym. Podkreśla się, że rosnąca emigracja prowadzi do *dziury demograficznej*, która zagraża stabilności gospodarczej i strukturze społecznej kraju. Zbadano związek pomiędzy poziomem bezrobocia, płacami i przepływami migracyjnymi, a także przeanalizowano doświadczenia krajów europejskich w przyciąganiu i integracji migrantów. Uwaga skupiona jest na związku pomiędzy sytuacją demograficzną a Celami Zrównoważonego Rozwoju (SDGs). W szczególności zbadano wyzwania związane z SDG 3 (*Dobre zdrowie i jakość życia*), SDG 8 (*Godna praca i wzrost gospodarczy*), SDG 10 (*Mniej nierówności*) i SDG 11 (*Zrównoważone miasta i społeczności*). Masowa migracja zmienia równowagę płci w kraju, pogłębia problem starzenia się społeczeństwa i wpływa na zasoby pracy, utrudniając osiągnięcie równości społecznej i stabilności gospodarczej. Zaproponowano model wpływu procesów migracyjnych na rozwój demograficzny Ukrainy oraz strategiczne działania minimalizujące negatywne skutki. Podkreśla się znaczenie włączenia zasad zrównoważonego rozwoju do polityki państwa dla zachowania kapitału ludzkiego i odbudowy potencjału demograficznego kraju.

Słowa kluczowe: rozwój demograficzny, zrównoważony rozwój, kapitał ludzki, Cele Zrównoważonego Rozwoju, stabilność gospodarcza

1. Introduction

Armed aggression and temporary occupation of part of the territory of Ukraine have led to a deepening demographic crisis, which consists in a significant decrease in the birth rate, an increase in the mortality rate among the military and civilian population, in the internal displacement of many millions of residents from dangerous territories, in the forced emigration of five million, mainly women and children, in particular, without any intention of returning. The demographic crisis is also deepened by the actual demarcation between two demographic processes – in the territory where state authorities exercise their powers in full, and in the temporarily occupied territories, which have actually come under the influence of external demographic factors.

It is worth emphasizing, that demographic challenges and threats to the development of Ukraine are increasing due to:

- rapid population decline due to depopulation (excess of deaths over births) and large-scale labour migration, which often becomes permanent, temporary occupation of part of the territory of Ukraine, new challenges and threats caused by armed aggression. According to the State Statistics Service of Ukraine (State Statistics Service of Ukraine, 2024), the current population of Ukraine on the date of the All-Ukrainian Population Census (December 5, 2001) was 48,5 million people. According to the Institute of Demography and Quality of Life Problems of the National Academy of Sciences (Institute of Demography and Quality of Life Problems of the National Academy of Sciences, 2024), as of January 1, 2022, the population of Ukraine was 42 million people, and as of July 2024, it was 35,8 million people, including in territories where state authorities exercise their powers to the full extent, – 31,1 million people;
- low birth rate. In 2020 (on the eve of the tangible consequences in Ukraine of the acute respiratory disease COVID-19, caused by the SARS-CoV-2 coronavirus), the total birth rate in Ukraine was 1,22 per woman compared to 1,53 in 2012, which is almost half the rate that ensures simple population reproduction (2,2). During the period of armed aggression (according to expert estimates), due to security risks, uncertainty about the future, separation of families, etc., this rate fell below 1;
- deterioration of the population's health due to insufficient effectiveness of measures to involve the population in a healthy lifestyle, as well as the inability to receive timely and high-quality medical care as a result of armed aggression, frequent unwillingness to contact the medical care system for diagnostics and health support, insufficient disease prevention, numerous stresses, prolonged stay in adverse conditions, which caused a decrease in immunity, exacerbation of old and the emergence of new chronic diseases;
- the increase in the number of people with disabilities and children with disabilities who need comprehensive rehabilitation and support;
- a high level of premature mortality, primarily among men, associated with mass employment in harmful and dangerous conditions.

- The impact of these factors was significantly intensified by armed aggression, which caused numerous deaths of military personnel and civilians, including children. As a result, the average life expectancy decreased, which in 2020 was 71 years (76 years for women and 66 years for men);
- mass forced emigration of the population, primarily women and children, associated with the danger, instability and uncertainty of life in Ukraine due to armed aggression;
- illegal deportation of Ukrainian citizens abroad, in particular, the deportation of at least 19,5 thousand children from the temporarily occupied territories to the Russia has been officially proven (Cabinet of Ministers of Ukraine, 2024);
- demographic aging (as of January 1, 2022, the share of people aged 60 and older was 24,8 %), which causes additional needs for medical and social services, places a significant burden on public finances and the working population;
- large-scale internal displacement of the population. In 2022, the number of internally displaced families with children increased six fold, according to Report on internal displacement in Ukraine (Cabinet of Ministers of Ukraine, 2024);
- excessive concentration of the population in relatively safe regions causes problems with the availability and quality of basic services, in particular housing, education, and health, and complicates the employment of internally displaced persons;
- behavioral patterns when a significant part of the population consciously postpones the time of birth of children until the time when potential parents consider their living conditions sufficient for raising a child (children), as well as when a significant part of the fertile population consciously limits the expected number of their own children to one or two, which does not ensure natural demographic reproduction. The conditions of armed aggression in which Ukraine finds itself create an additional argument for negative demographic attitudes;
- insufficiently flexible and insufficiently modern family legislation, in particular regarding the regulation of family and civil relations.

Taking into account the above challenges and threats, the effect of which will continue after the end of hostilities or the termination or abolition of martial law in Ukraine, the population of Ukraine, according to the assessment of the Institute of Demography and Quality of Life Problems of the National Academy of Sciences (Institute of Demography and Quality of Life Problems of the National Academy of Sciences, 2024), may decrease to 28,9 million people by 2041, and to 25,2 million people by 2051. Forecasting the population is complicated by the lack of necessary statistical data, in particular, due to the impossibility of recording demographic indicators in temporarily occupied territories, and the multivariate scenarios of the course of military events.

A feature of the migratory activity of the population is that, unlike all other natural human processes, there is a rapid reaction to economic, political and social changes in society, thereby directing population groups to where the economic situation is much more predictable, security, the level of tolerance and socio-psychological mood are more favorable. Migration affects the demographic structures of any country, changing both the population size and the structures of marriages and entire families, as Poznyak O. (Poznyak, 2016) rightly notes.

The issue of youth migration, as one of the main components of general migratory processes, also remains relevant. The indication of the migratory intentions of young people, first of all, should be aimed at ensuring that the number of emigrants gradually decreases, since young people are the most productive segment of society, which causes significant damage to the labour and demographic potential of the country. The catastrophic reduction in the population of Ukraine, according to the forecasts of many structures, will cause a vacuum, that migrants from third world countries, where the standard of living is already significantly lower than in Ukraine, will be willing to fill. Accession to the EU and the growth of economic well-being will become a catalyst for migration flows from poorer countries.

In such circumstances, it is important to consider how these processes relate to the concept of sustainable development, which involves ensuring economic, social and environmental sustainability in order to promote the well-being of present and future generations. According to the UN, migratory processes are both a challenge and an opportunity for sustainable development. The positive aspect is the potential attraction of resources, knowledge and experience of returning migrants, but the negative aspect is demographic aging, loss of qualified personnel and imbalance in the social structure of the population.

The purpose of this study is to determine the impact of migratory processes on the sustainable development of Ukraine and the formation of its demographic potential.

2. Literature review

Migratory processes of the population of Ukraine in recent decades have significantly influenced the demographic structure of the country. The influence of economic, social, political and military factors has become key in shaping

the modern migration profile of Ukraine. The main aspects of this problem are actively studied by both Ukrainian scientists, including: E. Libanova (Libanova, 2020), O. Malinovska (Malinovska, 2019; Malinovska, 2023), O. Poznyak (Poznyak, 2019), who study migration in Ukraine, its causes, consequences and possibilities of stabilization and foreign scientists, such as M. Koinova, F. Düvell (Koinova, Düvell, 2023), D. Pitoski (Pitoski, 2021). The issue of the multifaceted nature of the problem of regulating the migratory movement of the population has also constantly attracted the attention of researchers and has always been the subject of scientific research, in particular by such scientists as M. Romanyuk (Romanyuk, 2016), U. Sadova (Sadova, 2019), T. Astramovych-Leyk, J. Turchyn (Astramovych-Leyk, Turchyn, 2022) and others. In the context of the above, it should be noted, that understanding the threat of population decline intensifies the discussion of ways to overcome the demographic crisis, including the problem of mass emigration. In particular, there are proposals to limit the departure of men of draft age abroad even after the abolition of martial law. Measures aimed at improving the demographic situation, stimulating the return of Ukrainians from abroad and reducing the outflow of the population are also discussed. Ukrainian researchers, such as E. Libanova (Libanova, 2020), O. Poznyak (Poznyak, 2019), identify several key reasons for migration: economic (search for a higher-paid job), political (instability due to the war in eastern Ukraine), social (high living standards abroad) and security factors. The works of the Razumkov O. Center (the Razumkov O. Center, 2024) emphasize, that the main outflow of the population is associated with labour migration, which increased after obtaining a visa-free regime with the EU. The vast majority of migrants work in Poland, the Czech Republic and other European countries, which is confirmed by survey data from the Ilko Kucheriv Democratic Initiatives Foundation (Ilko Kucheriv Democratic Initiatives Foundation, 2024). Experts, in particular O. Gladun, an employee of the Institute of Demography and Quality of Life Problems of the National Academy of Sciences (Institute of Demography and Quality of Life Problems of the National Academy of Sciences, 2024), emphasize that mass migration contributes to a decrease in the number of working-age population in Ukraine, which worsens the demographic situation. According to research, about 30% of migrants do not plan to return to Ukraine, which poses a threat of a *demographic hole* in the long term. On the other hand, labour migration provides a significant inflow of funds through remittances, which in 2021, according to the World Bank (World Bank, 2024), amounted to over 12 billion US dollars. However, this does not compensate for losses due to declining birth rates and an aging population. Russian aggression against Ukraine has caused a massive outflow of population in the form of both internally displaced persons (IDPs) and international migration. According to THE OFFICE OF THE UNITED NATIONS HIGH COMMISSIONER FOR REFUGEES (UNHCR, 2024), more than 5 million Ukrainians have found refuge in neighboring countries since 2022. This creates significant pressure on the demographic situation, especially in the eastern and southern regions, which have lost a significant part of their population.

Analysis of literary sources indicates the multi-vector nature of approaches to the study of demographic stability, but despite a significant number of scientific works, the issues of studying demographic changes and migration processes through the prism of their impact on the sustainable development of the country remain open, which necessitates further research in this area. In particular, the UN Sustainable Development Goals (SDGs) such as SDG 3 (Good Health and Well-Being), SDG 8 (Decent Work and Economic Growth), SDG 10 (Reduced Inequality) and SDG 11 (Sustainable Urban and Community Development) are critically important for understanding the impact of migration on the country's socio-economic balance.

3. Materials and methods

The solution of the tasks is based on the use of general scientific and special research methods, including: *analytical* – for collecting, summarizing and processing scientific information on the state of development of migration and demographic processes; *abstract-logical* – for determining the motivational factors of population movements; *economic-mathematical, statistical* – for the purpose of comparative assessment of migratory trends in Ukraine. Based on statistical data by regions of Ukraine on the level of wages, unemployment rate, using the *STATISTIKA* program, a correlation-regressive analysis was conducted and the correlation dependence of the number of people who went abroad on a group of factors was proven, namely: on the level of wages, the number of unemployed, etc. *Tabular and graphic-analytical methods* were also used – for visual interpretation of theoretical provisions, obtained research results, in particular, the graph shows the dynamics of the birth rate in Ukraine for the period from 2010 to 2023; *analogies and comparative comparison* – to determine measures of influence on labour migration; *generalization* – to formulate conclusions based on research results.

The materials used for this study included analytical reports by the Institute of Demography and Quality of Life Problems of the National Academy of Sciences; the State Statistics Service of Ukraine; National Bank of Ukraine; the State Employment Service; the Ministry of Social Policy of Ukraine; the International Organization for Migration; the Ministry of Justice of Ukraine; the Analytical Center *United Ukraine*; the Office of the UN High Commissioner for Refugees, as well as the Strategy of Demographic Development of Ukraine until 2040; National Report of the Ministry of Economic Development and Trade of Ukraine *Sustainable Development Goals: Ukraine*, 2017; UN General Assembly Resolution *Transforming our world: The 2030 Agenda for Sustainable Development*.

4. Results and discussion

In the context of social and economic reforms and Ukraine's integration into the European space, the issue of rethinking generally accepted views and positions on migration and the role it plays in the quantitative and qualitative reproduction of the workforce, the effective and rational use of labour potential is becoming important. It should be noted, that the reform of the social and economic system, the restructuring of the economy and, above all, the structural restructuring of industry have led to a significant reduction in production volumes, the emergence of mass unemployment, a decline in the living standards of the majority of the country's citizens. It should be noted that large-scale external migration, low birth rates, high premature mortality, labour market imbalances, mass forced population movements within Ukraine, and other factors of population reproduction are key manifestations of negative demographic trends. Migratory movement in Ukraine is characterized by a significant excess of the number of emigrants over the number of arrivals over a very long period: at first this occurred within the former Soviet Union, then economic problems motivated Ukrainians to leave for the Russian Federation, and from the early 2000s – to Poland. Before the spread of the acute respiratory disease COVID-19, caused by the SARS-CoV-2 coronavirus, in Ukraine, the number of Ukrainian labour migrants abroad was 2,5-3 million people. In 2021, 875,800 Ukrainians received their first residence permits in EU member states, of which 83% of permissions to Ukrainians were issued by Poland. Employment was the main reason for issuing permissions to Ukrainians, 88% of documents were issued for this reason.

Armed aggression caused forced migration on an unprecedented scale since World War II: Ukrainians living in the territories where hostilities are taking place or temporarily occupied territories began to move en masse not only to relatively safe regions of Ukraine, but also to other countries. Currently, more than 6,44 million Ukrainians are abroad. And although migratory processes have slowed down significantly compared to the beginning of the full-scale war and there are no sharp fluctuations and surges in migration, Ukrainians, as before, are leaving abroad more than returning. It should be noted, that the demographic crisis was a pressing issue for Ukraine even before the full-scale invasion. But because of the war, the country is losing millions of people, and these are not just negative indicators, but a tragedy and a real demographic catastrophe. Experts do not deny that the country's population could shrink by a third, as the war, economic decline, and rising unemployment do not encourage those who remain in Ukraine to have children. According to the Ministry of Justice (Opendatabot, 2024), in 2023, almost a third fewer children were born in Ukraine than in 2021. However, the demographic crisis is not primarily a fertility crisis, but a crisis of replenishment of labour resources. After all, it is labour resources that the state lives on, and their reduction leads to difficulties with filling the state budget. Before the full-scale war, each million emigrants from Ukraine cost the Ukrainian budget minus 5 billion UAH. GDP, that is, over 185 million dollars (at the exchange rate at the end of 2021). Now the structure of the economy has changed, and if we calculate in dollar equivalent, it turns out that more than 6 million migrants result in potential losses for the Ukrainian economy of at least 1,1 billion dollars of GDP every year (Analytical Center *United Ukraine*, 2023). Migration is one of the key factors affecting the demographic situation, war and danger in Ukraine either restrain the birth rate or force women with children to go abroad. Fear of the future caused by the war makes it difficult for families to make a decision to have children. And forced migration only intensified the processes that existed in Ukraine even before the full-scale war – decline in the birth rate. But migration is also connected with the economic situation in the country, which, both before the full-scale invasion and now, encourages labour migrants from Ukraine to work abroad due to higher incomes and better living conditions. The huge impact of migration on demography is evidenced by how the countries that have sheltered the most Ukrainians are trying to keep them. First of all, these are Germany and Poland. According to the February 15, 2023 data of the Centre for Research and Analysis of Migration, since February 24, 21,929,212 people left Ukraine, while 13,060,039 returned home. Since the beginning of the war, around 8,2 million refugees have fled to Europe, but only 5 million have registered for temporary protection. The majority of Ukrainians, 1,6 million temporarily moved to neighboring Poland. According to UNHCR's official data, out of 5,1 million Ukrainian migrants, 2,7 million Ukrainian refugees registered for temporary protection in the countries included in the Refugee Response Plan. The agency clarifies that the number may include multiple registrations of the same individual in two or more EU+ countries; Therefore, the actual number is likely to be less than 2,7 million. 2,4 million Ukrainians requested asylum in other European countries (Operational Data Portal, 2024).

Also, from February 24, 2022 to September 30, 2022, 134,256 Ukrainians crossed the border of Georgia, however, only a small part of them stayed here. According to the data of the United Nations High Commissioner for Refugees (Operational Data Portal, 2024), as of December 2022, there are 25,402 Ukrainian refugees in Georgia. Unfortunately, the state does not have official statistics on Ukrainian refugees entering, leaving and staying here in Georgia. According to World Vision Georgia (World Vision Georgia, 2022), 94% of the refugees are Ukrainian citizens, half of them came from the regions of eastern Ukraine, which the Ukrainian government no longer controls. In addition to the fact that the refugees who came here bear the severe trauma of war and of losing their family members, relatives, their homes, they also have the experience of passing through *filtration camps* on the

territory of Russia and have serious health problems. 49% of the refugees entered Georgia from the Darial valley through Russia (PMC Research Center, 2023; Social Justice Center, 2023).

Initially, refugee families were coming to Georgia, and the gender balance of male and female refugees was almost equal. However, a large part of the men left Georgia, and today the majority of the refugees are women, children and elderly people. As of July 2022, 62% of Ukrainian refugees were women. Among them, there is a large number of persons with disabilities, chronic and oncological diseases. More precisely, according to World Vision Georgia (2022), 68% of Ukrainian refugees had to be separated from their family members, 24% have the status of a disabled person or have other serious chronic disease, and 29% have documentation problems. That is why the Ukrainian refugees remaining in Georgia are twice as vulnerable, which is essential for the state to take into account during policy planning (World Vision Georgia, 2022; PMC Research Center, 2023).

Due to the war, Ukraine is losing not only working-age people, but also children – future workers and taxpayers. It is not surprising that officials and experts periodically express a variety of ideas on how to return Ukrainians home - from creating new jobs in Ukraine to stopping payments to refugees in Europe (Khmelnyska, 2024).

It should be emphasized, that labour migration has been and remains one of the most massive among all types of territorial population movement, although labour migration in Ukraine under the conditions of European integration is significantly different from those that took place in previous years. The reasons for labour migration are different and depend on the characteristics of the social and economic development of the region, climate, material security of the population, the presence of certain social benefits, wage arrears, birth rate, political situation, etc. The correlation (Fig. 1) confirms, that workers are not satisfied with their wages, which is why they left and will leave the country.

The relationship between wages and the number of immigrants is quite strong, the correlation coefficient is $r=0,66$. The reliability coefficient is 95%. Since every employee (and especially specialists in their field) wants to have high pay for their work, taking into account the job duties that they perform. Dissatisfaction with wages encourages people to go abroad, where they are offered better working conditions and higher, in equivalent terms, wages. This is confirmed by the regression equation: $y = -10285,861 + 12,0159 \cdot x_1$, where x_1 is the wage of 1 employee.

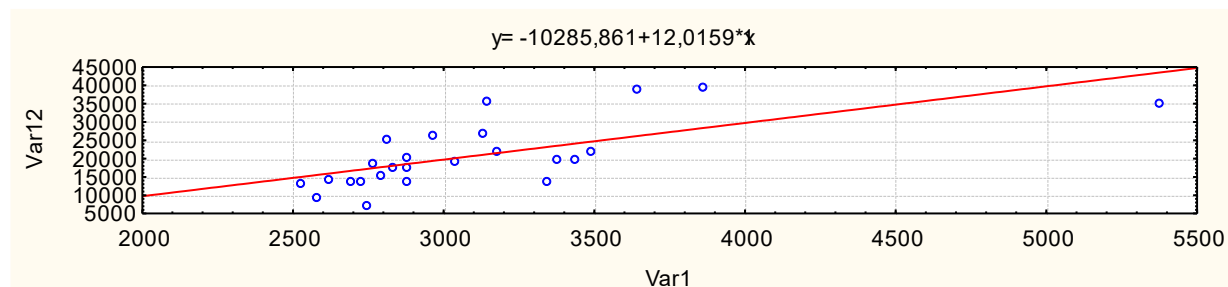
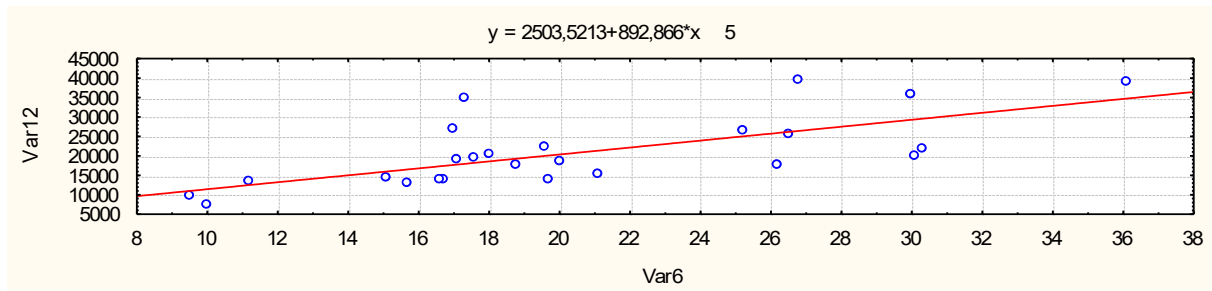


Figure 1. Correlation field of the number of people who went abroad depending on the level of wages, source: calculated by the authors

The most important indicator that affects migratory processes is the unemployment rate in the country. At the beginning of the full-scale invasion, many people lost their jobs. Now one of the biggest challenges for enterprises is the shortage of labour, despite the still significant unemployment. This means that structural unemployment in Ukraine has increased. The war has created extraordinary challenges for the labour market, in particular, the loss of personnel due to migration and mobilization, as well as changes in the employment structure. Many people have lost their jobs due to the full-scale war. According to the National Bank of Ukraine (National Bank of Ukraine, 2024), the unemployment rate remains high, although it has decreased from 21% in 2022 to 14%. However, the number of unemployed registered with the State Employment Service of Ukraine (State Employment Service of Ukraine, 2023) has decreased significantly: in January 2023 there were 166 thousand people, which is half the number in January 2022. At the beginning of 2024, the number of registered unemployed decreased by almost 40% to 101,4 thousand people. This is due to significant migration of citizens, as well as the fact that some men do not register as unemployed with the State Employment Center due to the lack of updated data in military registration and enlistment offices and do not get a job officially due to fear of mobilization. The correlation coefficient between the number of people who went abroad to the number of unemployed is $r=0.687$ (Fig. 2).



Note: x_5 – number of unemployed

Figure 2. Correlation field of the dependence of the number of people who left abroad on the number of unemployed (data by regions of Ukraine), source: calculated by the authors

Excessive labour migration (according to various estimates, from 2 to 7 million people) has always been a problem of the Ukrainian labour market. About 80% of labour migrants work abroad illegally, although Ukraine has signed bilateral intergovernmental agreements on the employment of migrants with 13 countries of the world, and negotiations are underway with 15. Our migrants have a fairly high educational level, higher or incomplete higher education. The fact that respondents usually work abroad not in their specialty is not a factor that inhibits migration. That is, sufficiently qualified specialists from various fields, educated people, on whose training significant, mainly state funds have been spent, cannot be realized in their own country, and therefore the funds spent on their training remain unused by the state.

The conditions for the return of Ukrainian migrants home (Table 1) can be divided into *framework*, that is, for all groups of migrants, and *focal*. The framework ones include security (the end of the active phase of the war), a new social contract (if people understand that in the event of an escalation of the military conflict, their rights and freedoms will be restricted again, no one will return to such a country), as well as long-term prospects (a positive scenario for the country's development).

Table 1. Conditions for the return of Ukrainian migrants home, source: compiled by the authors (Michkovska, 2024)

Groups of Ukrainian migrants		
The first focus group	The second focus group	The third focus group
Paternalists: - live on social benefits and assistance; - a category of women with young children who, for some reason, cannot socialize in Europe and look at the amount of assistance and benefits; - the social policy of the state is very important.	Professionals: - are focused on the level of net available income; - are interested in long-term prospects (mortgage, accumulative pension programs, medicine, education for children, quality of life in general).	Entrepreneurs: - compare everything: business conditions, interest rates on loans, interaction with the tax office, etc.; - to encourage entrepreneurs to return, it is necessary to create conditions for business that are more comfortable than in the EU.

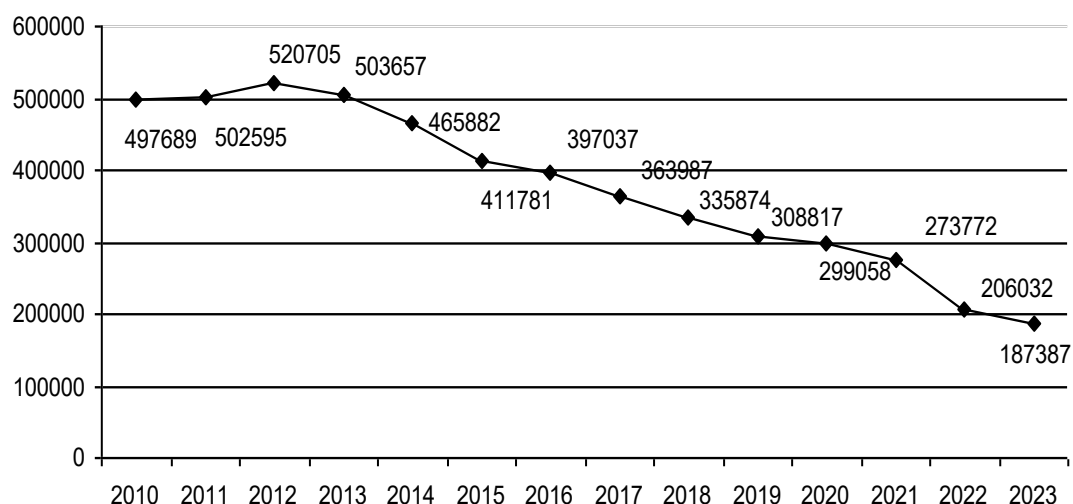


Figure 3. Birth rate in Ukraine from 2010 to 2023, people, source: compiled by the authors based on State Statistics Service of Ukraine

It should be noted, that Ukraine is already facing a number of demographic problems, from falling birth rates to the formation of a gender imbalance. Ukraine's population will continue to decline and age, including due to a

sharp decline in birth rates. For comparison: in 2021, 267 thousand Ukrainians were born, and in 2023 – only 187 thousand or almost 30% less (Fig. 3).

The fertility rate in Ukraine today is only 0,8–0,9 children per woman. For comparison: in 2020, this figure was 1,2 per woman, while the level that ensures simple population reproduction is 2,2.

In general, a decline in the birth rate (Marushchak, 2023; Strelko, 2023) has been observed in Ukraine since 2013. From then until the start of the full-scale war, 6–7% fewer children were born each year. In the first year of the invasion, the number of newborns fell sharply — by as much as 25%, to 206 thousand children. For comparison, in the period from 2010 to 2013, about half a million children were born in Ukraine per year. The largest decline in the birth rate in 2023, excluding temporarily occupied territories and areas of hostilities, was recorded in Kyiv — 19,979 babies. This is 33% less than in 2021 (Opendatabot, 2024).

The full-scale war that Russia unleashed in Ukraine is continuing for the third year. No one knows when it will end exactly, and the consequences may be disappointing.

Currently, a large number of children are being taken abroad in Ukraine. Of course, the outflow of youth is a problem, a negative aspect, but it is understandable that parents, who fear for the lives and health of their children and therefore decide to send their children to study abroad after grade 11. First of all, Poland, the Czech Republic, and Slovakia are being considered. A foreign diploma provides more opportunities for employment, in particular, abroad, because European education has certain standards, that are acceptable to employers in the EU. Considering the fact, that the birth rate in the country is at a very low level, the export of children is dangerous for demography, that is, it undermines the demographic potential of the country. This threatens that the aging of the population in Ukraine will increase even more rapidly. Before the war, the share of people aged 60 and older was approximately 23-25%, and at the same time, Ukraine was not considered the most *old* country in Europe. Although this rather high indicator leads to significant pressure on the social infrastructure, puts an excessive burden on certain social funds, in particular on the Pension Fund. After the war, it will be quite difficult for the state to pay all these pensions; in addition, the number of people with disabilities due to the war, who will be entitled to payments will increase. Problems with employment of such people will deepen, it will be necessary to create new jobs, to ensure that such a person does not feel disconnected from society.

The demographic situation may significantly worsen in Ukraine after the end of the war. Among the possible threats are a reduction in the age group of children under 14 years old, the difference in the ratio of women and men. After all, the longer the military operations continue, the more the probability of our compatriots who left for Europe to escape the war will decrease.

In general, the number of Ukrainian refugees is estimated by the Office of the United Nations High Commissioner for Refugees (UNHCR, 2024) at 6,7 million people, that is, more than 4 million of our citizens live in EU countries, according to various surveys, from 25-50% of the population plans to stay abroad, that is, only about 3 million people will return to Ukraine. European countries are characterized by *aging*, as is Ukraine, so there is a struggle for human resources. Therefore, many European countries are now implementing an active policy of adaptation of Ukrainians abroad, primarily language courses, and an active policy is also being implemented regarding the mandatory employment of migrants. If a person has found a job and everything is more or less fine with housing, then the likelihood that he will return to Ukraine will decrease. It should be noted, that this struggle began even before the war, due to economic factors, when many people from Ukraine left for work, and then remained for permanent residence in EU countries. In the context of the above, we note that such European countries as Germany, the Czech Republic, Finland, Austria – teach foreigners in higher education institutions for free, including Ukrainians. That is why Ukrainian youth do not want to return to Ukraine, given that the Ministry of Education and Science is now introducing a transition to practically paid education in higher education institutions in almost all specialties, except for doctors, teachers and the military.

As is known, sustainable development is defined as the interaction of man with the environment. Strong ties between man and nature in the territories of residence of persons who become refugees are broken during the movement of persons. However, in the territory of their further dislocation, the ties between man and nature are not restored, but transformed, since refugees establish new ties that have already been formed among the indigenous population of the country of refuge.

It will most likely be possible to slow down the population decline if an active demographic policy is implemented, but it will continue anyway. And the consequences of this war will be very negative in a demographic sense, because the current population has a worse sex-age structure than it did after World War I, after the Holodomor, after World War II. The level of population aging is high, the birth rate is very low, and all this will be extremely difficult not only to restore after the war, but also to maintain the population at a certain level due to natural factors (birth rate and increased life expectancy).

In order to correct the situation with the demographic crisis and initiate changes, the government adopted the Demographic Development Strategy until 2040 (Cabinet of Ministers of Ukraine, 2024). The strategy is aimed at overcoming key demographic challenges that have been exacerbated by armed aggression. The main tasks include increasing the birth rate, reducing premature mortality and ensuring growth of migration. The strategy takes into

account the need to stop population decline and create conditions for sustainable long-term reproduction of human capital.

The priorities for ensuring demographic development are supporting families, preserving reproductive health, improving working conditions and increasing the availability of medical and social services. Special attention is paid to minimizing the outflow of Ukrainians abroad, supporting internally displaced persons and creating incentives for the return of migrants. An important component is the formation of an environment favorable for the birth and upbringing of children, ensuring the economic self-sufficiency of families. In addition, the Strategy (Cabinet of Ministers of Ukraine, 2024) provides for the search for quick solutions to adapt to demographic challenges in order to gain demographic resilience – the ability of the population to adapt to demographic changes and challenges while maintaining the stability, viability and identity of society; the ability to preserve demographic potential under the influence of negative demographic trends. In this case, it is worth focusing not only on quantitative indicators of population size, but also on the quality of life of people, the quality of human capital, which means high quality education, preservation of health, longevity, high labour productivity, involvement of citizens in the labour market and governance in communities, etc.

As for the forecasts, how many Ukrainians there will actually be in a few decades, they are actually different. They are made by experts from the UN (United Nations, 2024), the CIA (CIA, 2024), Eurostat (Eurostat, 2024), as well as other institutions and organizations, the population size depends on the parameters of birth rate, mortality rate and migration, when developing forecasts for Ukraine, the year of the end of the war is a very important factor (Khmelnyska, 2024).

It all depends on what model of economic development will be chosen after the end of the war and how much labour force it will need, which industries will be in first place. Will Ukraine exist only as a raw material state, or, on the contrary, will it develop processing and sale of finished products. And even if imagine that the birth rate in Ukraine will increase significantly, which is also far from a fact, since it is completely unclear what incentives there may be for this, the new generation will enter the labour market only in a few decades. Therefore, the simplest, although at the same time complex solution to the problem today is to attract labour migrants from other countries. In order to just maintain the population in Ukraine, it is necessary to attract 350 thousand every year – that is, as much as our population is decreasing (All-Ukrainian Association for International Employment, 2024).

The Government's Demographic Development Strategy (Cabinet of Ministers of Ukraine, 2024) also provides for the possibility of attracting immigrants to Ukraine. *The experience of Canada and Australia shows that the success of the policy of attracting immigrants depends on the clarity of defining the goals (how many people, what specialists, what qualifications, in which regions it is advisable to attract, under what conditions they can enter), the integration and cultural adaptation of immigrants in order to avoid hostility and discrimination, as well as facilitating the organization of easy and understandable access to services and information about administrative procedures and services*, the document states (Cabinet of Ministers of Ukraine, 2024). It is in Canada and Australia that a points system for attracting labour resources operates based on such criteria as age, qualifications of potential migrants, as well as their demand on the labour market, both in the country as a whole and in its individual regions.

As for European countries, the situation with immigration is significantly worse, primarily because of its chaos. Despite the fact that some European countries declare their intention to borrow elements of the Australian-Canadian model, nothing fundamentally changes there yet. In any case, migrants go to Canada and Australia, to Europe, and to the USA for a better life, which they do not see the possibility of having in their homeland. But will Ukraine be attractive to immigrants, whose citizens, even without taking into account the war factor, are themselves looking for the same better life abroad? Are Ukrainians themselves ready for the fact that on the streets of the country's cities, as well as at supermarket checkouts, in restaurants, hairdressers, hospitals, at gas stations and many other places, people of different nationalities, races, beliefs, whose mentality is significantly different from ours, will appear in large numbers? We note the fact that Ukrainian society is used to living in a mono-national, mono-racial, mono-cultural, mono-religious environment, and therefore Ukrainian society needs to be prepared for the fact that everything is changing, and this is also the case. At the same time, it is not at all necessary that Ukraine will become a place of attraction for citizens from the poorest countries in the world, and moreover with a mentality alien to us. We should agree with Ella Libanova (Libanova, 2023), who emphasizes that *there will be a lot of problems (with the adaptation of migrants), but I am far from sure that people who are so different from us will be attracted*.

Without labour immigration, the Ukrainian economy simply will not be able to fully function. Mass immigration in the minds of many is millions of people from disadvantaged countries who do not work, receiving generous social assistance. This type of immigration is widespread in many countries of the European Union. However, according to experts (All-Ukrainian Association for International Employment, 2024), Ukraine is not threatened by this, since it is a poor country and cannot offer high social assistance, not only to immigrants, but even to its own citizens.

It should be emphasized, that migratory processes are closely related to the Sustainable Development Goals (SDGs) in economic, social and environmental aspects, as they affect different levels and aspects of society, and also determine important directions of development. Let us analyze how human migration is related to the SDGs in each of these aspects (Governmental Portal, 2024):

1) Economic aspect (SDG 8: Decent work and economic growth)

Labor migration significantly affects the economic development of Ukraine. On the one hand, remittances from migrants constitute a significant share of the country's GDP, but on the other hand, the outflow of skilled workers creates a shortage of labor resources. It is considered important to develop policies to stimulate the return of migrants, create decent working conditions and improve the level of wages.

At the same time, migration can have both positive and negative effects on economic development for both countries of origin and host countries, in particular:

- a positive effect on host countries, as it helps to cover labor shortages in certain sectors of the economy (for example, in agriculture, construction, health care). Migrants can stimulate economic growth, investment and business development. They often create new jobs, filling the need for low-skilled labor and contributing to the development of infrastructure;
- economic benefits for countries of origin through remittances from migrants, which can be an important source of income for families and stimulate development at the local level;
- migration can contribute to economic growth through the development of the workforce, if working conditions are fair and equal opportunities are provided for all, regardless of origin (Goal 8 (Decent work and economic growth));
- migration can help reduce economic inequality by providing people from poor countries with the opportunity to work in more developed regions and earn higher incomes (Goal 10 (Reduced inequalities)).

2). Social aspect (SDG 10: Reduce inequalities, SDG 11: Sustainable urban and community development)

Demographic imbalance threatens social stability. Mass migration of women and children leads to a change in the gender ratio in the country, and the depopulation of certain regions leads to an increase in the burden on urban communities. The policy of social integration and support for internally displaced persons is critically important for the country's recovery. Migration processes have a serious impact on the social structure and integration into society. It can contribute to strengthening cultural ties, but it can also cause challenges:

- migration can be a way for people living in poverty to improve their material situation by gaining access to better working conditions and education (Goal 1 (End poverty));
- migration to cities can be both an opportunity to develop new infrastructure projects and improve living conditions, and a challenge for local authorities to provide housing, health services and other necessary resources (Goal 11 (Sustainable urban and community development));
- migration can be a consequence of social or political conflicts. In this case, it is important to create conditions for the safe integration of migrants, ensuring their rights and access to basic social services. At the same time, it is necessary to create policies that will promote integration and combat discrimination (Goal 16 (Peace, justice and strong institutions));
- migration can have a positive impact on gender equality, giving women access to new opportunities for work and personal development. However, women often face additional social challenges, such as discrimination and restrictions on rights (Goal 5 (Achieve gender equality)).

3). Environmental aspect (SDG 3: Good health and well-being)

The consequences of war, environmental pollution and the deterioration of the quality of life in the war zone significantly affect the health of the population. The reconstruction of the country must include measures for environmental rehabilitation, ensuring access to health services and supporting a healthy lifestyle among the population. Migration has a significant environmental dimension, as climate change and natural disasters are the main factors that push people to relocate:

- people living in areas most affected by climate change (droughts, floods, storms) are often forced to migrate due to lost resources and infrastructure. Climate-related migration requires international coordination and planning to adapt to new conditions (Goal 13 (Action climate change));
- migration can affect the environmental situation in host regions if sustainable infrastructure development and resource management are not ensured. Poorly planned migration flows can lead to environmental degradation, in particular through the overstrain of natural resources such as water and energy resources (Goal 12 (Rational use of resources));

- migration can put pressure on ecosystems in host areas, especially in places where urbanization is expanding. This can lead to biodiversity loss, land degradation and landscape change (Goal 15 (Conservation of terrestrial ecosystems)).

Therefore, migratory processes are closely related to sustainable development goals in various aspects, and to ensure its positive impact on development, it is necessary to develop holistic policies that will promote social integration, economic opportunities and environmental sustainability. And given that the war caused by Russia has caused a lot of damage to the environment of Ukraine (destruction of ecosystems, soil pollution, reduction of biodiversity, increase in the number of pests in forests, etc.), the environmental component is becoming more relevant than ever. It is now even impossible to fully assess the impact of the war on the environment due to the lack of accurate information. There are two reasons for this. First of all, even collecting this data is dangerous for specialists, since active hostilities are ongoing. Second, not all information can be voiced publicly for tactical purposes. In addition, rebuilding the country will require a significant amount of natural resources. There is also a risk that Ukraine will not meet its already set climate goals, as war is a contribution to climate change, and the country's recovery will inevitably be accompanied by significant greenhouse gas emissions.

And while the war continues, the scale of environmental damage inflicted on Ukraine by the war continues to grow. Every day, russian shelling causes new destruction, pollution, fires, and mining, turning unique natural areas into ecological disaster zones. Over more than 1,000 days of war, fires caused by shelling have destroyed more than 680,000 hectares of forests. Forests in Donetsk, Luhansk, Kharkiv, and Kherson regions have lost up to 30% of their area. Some unique natural areas, such as the Kinburn Peninsula, have burned almost completely. National parks, including Askania-Nova and Nizhnyodniprovsky, have experienced massive fires and mining.

Explosions and shelling polluted rivers and reservoirs, including the Dnieper, Seversky Donets, and Southern Bug. The collapse of the Kakhovka hydroelectric dam in June 2023 was an environmental disaster. The water flooded 55,000 hectares of land, and with it chemicals, petroleum products, and even mines entered the soil and water bodies. Ukraine lost one of the largest irrigation systems, which is critically important for the southern regions (Ecoaction, 2024)

Ukraine has been losing population throughout its independence. The main reason is that more people die than are born. Over 30 years, more than 6 million people have died, while 3,5 million have been born, and during the years of economic crises, the gap between those born and those who died has increased. The model of the impact of migratory processes on the demographic development of Ukraine is shown in Fig. 4.

It is currently impossible to say the exact number of people living in Ukraine. By the way, the population includes not only Ukrainians, but also foreign citizens, who permanently reside in the country. All the figures that experts give are conditional, especially since the war began, two categories of the population were obtained: those who remained in the country and those who left abroad.

Absolutely accurate data simply does not exist, because even before the war, the registration of Ukrainians had gaps, and the last population census was conducted back in 2001. According to the UN recommendation, a population census should be conducted once every 10 years, because during this period the accuracy of the population registration is lost mainly due to migration. In Ukraine, birth and death rates are recorded quite accurately, but migration is not. According to estimates by various experts, after 2001, from 1,5 to 3 million people left Ukraine for permanent residence abroad, that is, these people who actually live in other countries, but remain in Ukraine according to the registration. This situation arose because Ukraine had not conducted a population census for over 20 years, which resulted in the loss of accurate population figures. Therefore, a population census must be conducted after the war. The State Statistics Service must organize this process. According to Oleksandr Gladun, an employee of the Institute of Demography and Quality of Life Problems of the National Academy of Sciences (Institute of Demography and Quality of Life Problems of the National Academy of Sciences, 2024), the problem with recording the population in Ukraine existed long before the start of Russia's full-scale invasion – "The State Statistics Service excluded the population of Crimea from the total number provided, and left the SDDL (separate districts of Donetsk and Luhansk regions) completely.

Although experts could not calculate either the birth rate or the death rate in these territories. *Frozen* data as of 2014 were provided. This was also somewhat misleading. It was necessary not to include the population of the SDDL, as well as Crimea, in the population of Ukraine, but to consider them as an occupied territory. Why this happened, they do not explain to us or do not want to do it. Usually, in countries where part of the territory is occupied and it is impossible to conduct a population census, this territory is excluded from the census and only the population in the controlled territory is taken into account. After the territories are returned to control, the population census is resumed using the same census and the restoration of the census of demographic events. *By the way, according to the scientist, when Russia occupied Crimea in 2014, it quickly conducted a population census in October of that year.*

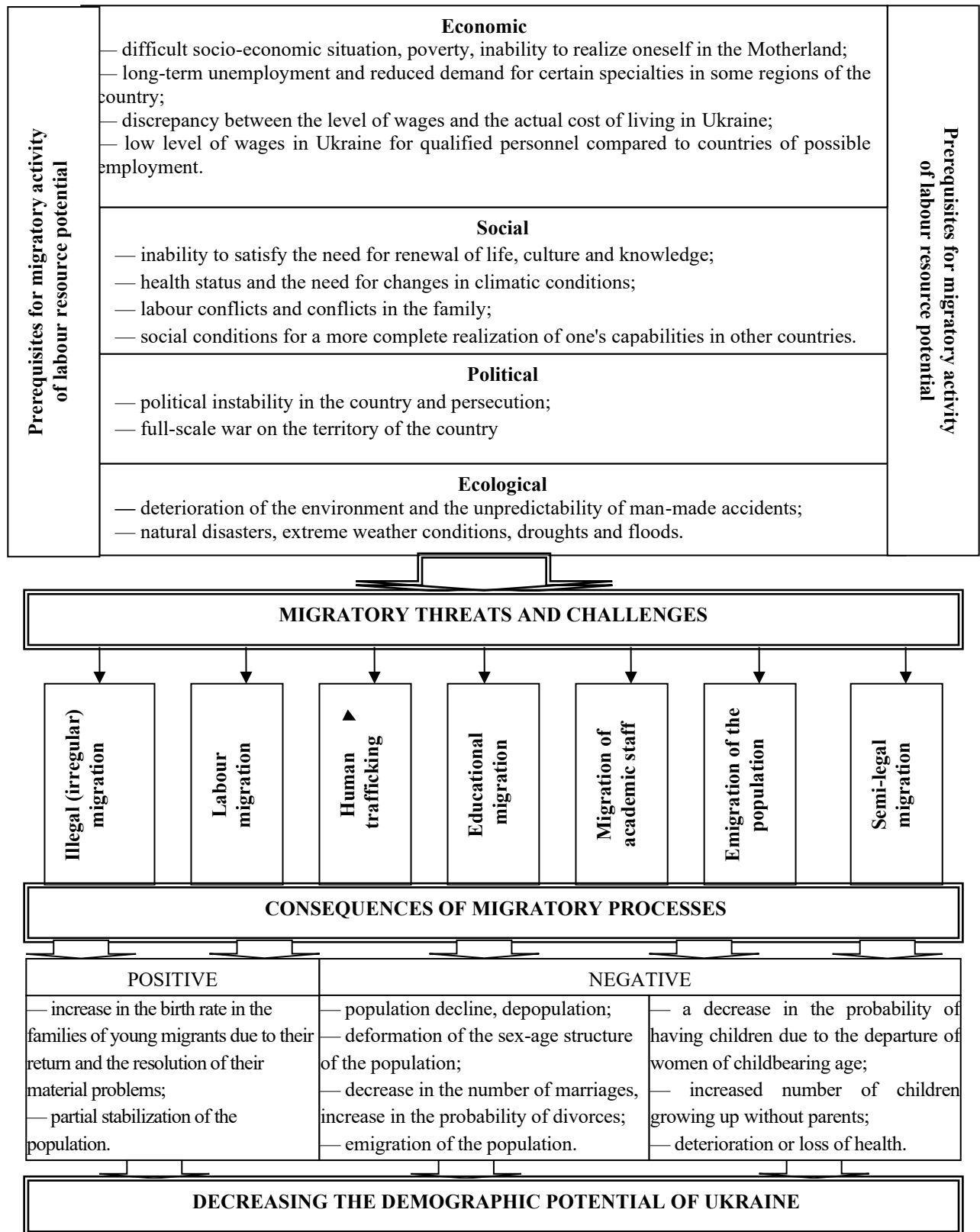


Figure 4. Model of the impact of migratory processes on the demographic development of Ukraine, source: constructed by authors

They wanted to know how many people live in the territory they occupied, determined the human resource of the region and took everything into account. And in Ukraine, unfortunately, they have not been able to do this since 2001 (Marushchak, 2023).

The level of attractiveness of Ukraine for migrants will largely depend on how the situation with foreign investments develops and how the situation in the economy develops. It is clear that people migrate in

search of a better life from poorer countries to richer ones. The exception may be people who come to popular specialties and who are offered big money. Those who have already achieved everything in their profession at home and are ready to change their environment and share their experience may come. This may be a certain social mission. But such migration will not be massive.

Thus, migratory processes in Ukraine over the past decades have had a significant impact on the demographic structure of the country, which, in turn, affects the achievement of the United Nations Sustainable Development Goals (SDGs). Let us consider how these processes correlate with individual SDGs (Table 2).

Table 2. The impact of migratory processes on the achievement of the UN Sustainable Development Goals, source: constructed by authors

UN Sustainable Development Goal	Characteristics of the impact of migratory processes
Poverty Eradication (Goal 1)	Economic factors, such as the search for better employment opportunities, encourage Ukrainians to emigrate. This may indicate an insufficient level of economic development and social support within the country, which hinders the achievement of this Goal
Good Health (Goal 3)	The full scale invasion of Ukraine has resulted in numerous casualties among military personnel and civilians, underscoring the need to improve the health system and provide medical services to those affected.
Quality education (Goal 4)	Mass emigration of young people can lead to a <i>brain drain</i> , which negatively affects the potential of the education system and the development of human capital in Ukraine.
Gender equality (Goal 5)	Emigration often affects mainly women, which can affect the gender balance and social structure in the country, in particular, since the beginning of the full scale war, women of reproductive age and children have left abroad.
Decent work and economic growth (Goal 8)	Economic difficulties and the search for better working conditions abroad indicate the need to improve the domestic labour market, create decent jobs and stimulate economic growth.
Reducing inequality (Goal 10)	Internal and external population movements can deepen social and economic inequalities, both between regions and between different social groups.
Cities and communities (Goal 11)	The significant number of internally displaced persons places additional pressure on the infrastructure of cities and communities, requiring adaptation and development of the urban environment.
Responsible consumption and production (Goal 12)	Migration can affect consumption patterns and production processes, which needs to be taken into account in sustainable development strategies.
Peace, justice and strong institutions (Goal 16)	War and its consequences undermine peace and stability, which are the basis for achieving other Sustainable Development Goals.
Partnerships for the Goals (Goal 17)	Effectively addressing migration challenges requires cooperation between government authorities, international partners and civil society.

Migratory processes in Ukraine are a complex challenge that affects the achievement of the Sustainable Development Goals. To effectively respond to these challenges, it is necessary to integrate the principles of sustainable development into all areas of state policy and provide comprehensive support for internally displaced persons and emigrants.

5. Conclusions

Serious challenges to the development of demographic potential and threats to demographic security caused by migratory processes for Ukraine are: an increase in the scale of migration abroad, primarily labour; increased participation of young people and specialists in labour migration; an increase in the share of migrants who work abroad without proper permits and are in an unregulated legal situation; transformation of part of temporary labour migration into permanent. Of course, an increase in the scale and duration of migrants' stay abroad will inevitably lead to a weakening of their ties with the Motherland, and the country will ultimately lose part of its labour and intellectual potential. The shortage of labour resources can become an obstacle to economic development, and the

outflow of the most active, young and educated people can become an obstacle to democratic transformations in Ukraine. Of course, all demographic processes provoked by the war have a negative impact on the country's economy. The security factor, due to which many people left, has already led to the complete deindustrialization of the eastern regions and the loss of the potential of the agricultural sector, in particular in the south of Ukraine. Along with the movement of people, there is also a movement of the economy and an imbalance in labour markets. Considering the unfavorable demographic situation in the country, the rapid aging of the population and the inevitable shortage of labour in the near future, migratory challenges and threats cannot be neglected.

In the context of the above, it should be noted that the sustainable development of Ukraine requires a comprehensive approach to demographic challenges. It is important to integrate the principles of sustainable development into demographic policy; stimulate the return of migrants through economic and social initiatives; ensure balanced development of regions, in particular, support for rural areas, taking into account social and environmental factors; develop environmentally sustainable infrastructure and implement programs to restore natural resources; use international experience in integrating demographic processes into state policy.

And taking into account global trends, Ukraine's integration into the world economy should be accompanied by strategies that will comply with the UN Sustainable Development Goals and contribute to the restoration of the country's demographic potential.

Ukraine's reconstruction must take into account global trends in sustainable development and meet the UN goals, ensuring long-term stability and well-being of the population. Creating effective mechanisms for integrating demographic policy into the country's reconstruction will be an important step towards sustainable development and strengthening the socio-economic stability of Ukraine.

Only successful reform and development of Ukraine can be a real safeguard against population losses caused by migration, in order to ensure the rights and interests of the state and its citizens in the process of migration, the improvement of migratory policy, the consideration of migratory problems in strategic planning are of paramount importance today, which are prospects for further scientific research.

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