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The correlation between demographic processes and demoethical values of sustainable societal development in the context of climate and energy migration and water scarcity

Abstract

Object: To study the interrelation of demographic processes in the context of the most pressing global issues related to water resources, climate, energy migration, and demoethical values as a tool for the transformation of sustainable development in society.

Methods: The study utilizes the concept of Demoethics, which is based on the priority of spirituality as the basis for a new stage or model of sustainable development in society, which involves integrating the demographic, socio-economic, and ecological components into the overall processes of modeling.

Findings: The proposed approach focuses on organizing activities to improve sustainable development. In particular, a demographic model is presented, which is important for the Society 5.0 and Industry 5.0 organizations. Through literature review and analysis, this research identifies key issues in the sustainable development of the demographic component of the economy based on the demoethical model and provides practical recommendations for stakeholders involved in digital transformation.

Conclusions: In order to achieve the Sustainable Development Goals (SDG) for countries, civil society, and international institutions by 2030, commitments have been made to accomplish a range of tasks, from reducing extreme poverty to ensuring environmental sustainability and universal education, reducing child mortality, and promoting gender equality. Despite the fact that adaptation activities directly contribute to achieving SDG 13, which focuses on taking action against climate change, it should be seen as part of a strategy to strengthen a country's achievements in implementing all other SDGs based on the value of Demoethics.

Expected results: The results of this study can serve as a basis for supporting targeted policies and the transformation of demographic components of the economy.

Keywords: sustainable development goals (SDG), sustainable development, demoethics values, climate migration, energy migration, Central Asia's security, water resources, quality of life, transformation.

Introduction

Migration due to climate change will become one of the defining trends of population movement in the 21st century (Brown, 2017). One of the most pressing global issues today revolves around water resources and the resulting migration. People often use their movement as an adaptation strategy to improve socio-economic conditions, leading to international and internal migration movements (Nagabhatla et al., 2020b). Furthermore, the linkages between "water stress", migration, and gender represent a significant research gap, which is further exacerbated by the consequences of climate change and extreme events.

Taking into account the individual Sustainable Development Goals (SDG), particularly SDG 3 (good health and well-being), SDG 6 (clean water and sanitation), SDG 7 (affordable and clean energy), SDG 10 (reduced inequalities), SDG 13 (climate action), and SDG 16 (peace, justice, and strong institutions), we have outlined recommendations and strategies while discussing multiple narratives applicable to the connections between water resources, climate and energy migration. Key points include an orientation towards long-term sustainable solutions and increasing stakeholder participation in decision-making processes.

Literature review

Scientific research and international reports increasingly recognize that stress factors related to the environment and water resources, loss of livelihoods and income opportunities, force people to leave their homes. According to recent analysis, over 50% of forced displacement is linked to climate change and water resources (Nagabhatla et al., 2020a).

Access to water provides the foundation for human existence, culture, and progress (Smith & Wandel, 2006). Authors Adams et al. (2009) and Smith et al. (2009) argue that “water stress” undermines local systems and established survival strategies, which in turn trigger new patterns of human migration (Black et al., 2011a). “Water stress” refers to the circumstance where water needs are not met due to decreased availability and/or quality. “Water stress” is often considered in terms of water scarcity, drought occurrence, longer dry periods, water shortage for irrigation, and abrupt seasonal weather changes.

Other researchers study the problem of air pollution in China and argue that one of the main causes of one million premature deaths every year are eco-logical issues that affect human health (Yang et al., 2013; Lelieveld et al., 2015). In the same context, a number of articles have been studied on the issue of air pollution, direct energy consumption in residential and transportation sectors (referred to as “RTC” in this study, which includes direct energy consumption for cooking, heating, lighting, and operation of household appliances, as well as energy consumption by private and public transport). RTC contributes significantly to air pollutant emissions, such as carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO₂), black carbon (BC), organic carbon (OC), and benzo [a] pyrene (Ohara et al., 2007; Huang et al., 2014). Mass migration from rural areas to cities has significantly changed the spatial distribution of RTC emissions and has an impact on the population for several reasons.

Today, most of the population lives in cities. The emission level of RTC pollutants in cities is significantly higher than in rural areas. Accordingly, as the population in cities increases, the percentage of people exposed to these emissions increases, which has an important impact on the health of the population as a whole across the country.

On the other hand, per capita RTC emissions tend to decline as migrating populations shift to a cleaner energy mix. For example, most people moving to cities are moving away from using biomass fuels and starting to use energy sources or fuels that emit less air pollutants (China Statistics Press, 2014; Ru et al., 2015). These two reasons compete in terms of impact on public health.

We agree with the results of the study by Shen et al. (2017) issues of population migration and related policies, which will determine the demand for electricity and the energy structure itself in the near future.

The Groundswell report (Clement et al., 2021), which was published by the World Bank, noted that the number of climate (or environmental) migrants in the world will grow to 216 million by 2050. According to the findings of this report, large-scale population migration in the coming years will occur due to sudden or gradual changes in nature, such as rising sea levels, extreme weather events (such as heat or cold waves), drought or lack of fresh water. The climate is transforming unevenly, so as a result of global warming, some regions, for example, the Arctic, will become significantly warmer, while others will become colder.

In the context of environmental migration, it is customary to talk about third world countries in which climate change leads to hunger and increased mortality. The World Bank report notes that the focus is on regions such as North Africa, Eastern Europe and Central Asia. Moreover, it is necessary to understand that “no region is immune from this problem”.

Also, according to the same World Bank report (Clement et al., 2021), after 2050 the pace of internal climate migration may accelerate if countries do not bother to reduce greenhouse gas emissions, and by the thirtieth year of the twenty-first century climate change will begin to appear. Migration between regions — people will begin to move to countries that are safer in terms of climatic conditions.

Deputy Head of Sustainable Development at the World Bank, Juergen Voegele, notes that if measures are taken in the near future to reduce emissions and restore nature, the number of climate migrants could decrease by up to 80% (Clement et al., 2021). However, it is currently unknown whether such measures will be timely implemented, and according to UN reports on climate change, the situation with global warming is worse than anticipated, and even lockdowns due to the COVID-2019 pandemic did not help reduce greenhouse gas emissions. For example, according to one model of greenhouse warming presented by the Geophysical Fluid Dynamics Laboratory (2023), the climate of Southern Europe will lose 30 to 40% of its moisture by 2040, and by the end of 2100, there will be a sharp melting of ice, which will have a detrimental impact on coastal cities. Based on the described scenario and observations of weather changes, such as rising temperatures in northern regions (for example, in September 2023, the highest temperature ever recorded in

St. Petersburg was 25.3°C), increasing precipitation in Southeast Asia at high temperatures (above 33°C), it can be noted that these changes will have a significant impact on human health in all regions of the world, not just the poorest ones.

Investor, visionary, founder of “nextbiglink”, and former CEO of RAO UES Alexander Chikunov identifies two main directions of climate migration: internal, which is usually caused by natural disasters, and transnational, triggered by the intensification of risks caused by climate change (increased poverty, hunger, inequality, etc.). Natalia Makovetskaya, Director of ESG Practice at Baikal Communications Group, explains that in both cases, migration occurs involuntarily, but international law does not protect them as it does refugees. In fact, climate refugees are not legally protected (Vecherova, 2022).

In the same context, Julia Kuznetsova, Associate Professor at the Faculty of Geography and Geoinformation Technology at HSE University, highlights two directions of climate migration in Russia: southern and northern. The outflow of people from the Arctic has always existed, but now it is expected to increase as glaciers melt and infrastructure in permafrost areas collapses. In the southern direction, emigration from Central Asia and the Caucasus is driven by a lack of freshwater, not only for drinking but also for irrigation. “It is projected that in the coming decades, the flow of migrants from these regions will increase. Currently, migration from these areas is driven by economic reasons, but soon climate-related reasons will be added”, the expert believes (Vecherova, 2022).

According to a Redfin (2021) study conducted in the United States, many residents are starting to consider climate change when determining where to live. More than 36% of respondents noted that rising sea levels were a factor in their decision to relocate, while 49% cited the need to move due to increased frequency of natural disasters. Economist Daryl Fairweather, in the same Redfin (2021) study, stated that the most competitive and expensive places to buy property will be those that are not at risk of increased natural disasters, extreme temperatures, and rising sea levels. California residents leave during the summer to avoid wildfires, while some are forced to permanently relocate due to the loss of their homes in natural disasters. Approximately 75% of residents would not consider buying a home in an area prone to various climate risks, according to Redfin (2021). As noted by the international expert community addressing this issue, there are few ideal places for comfortable human habitation on planet Earth, but even they will experience various impacts from anthropogenic factors such as waste disposal, overpopulation, lack of clean water, and as a result, a higher cost of living.

However, the study of scientific works did not reveal the presence of research on the interconnection between demographic processes and the most acute global problems related to water, and as a result, climate and energy migration, as well as demoethical values as a tool for transforming sustainable development of society.

Therefore, transdisciplinary, demoethical, and human-oriented research is necessary, which would emphasize the values and needs of people in managing the demographic components of the economy.

The aim of the study is to:

- identify and analyze the causes, trends, and forecasts of climate and energy migration and propose recommendations for future research on this issue;
- apply demoethical values in the demographic component of the economy, which can contribute to the transition to sustainable development.

Materials and methods

The aim of this study is to explore the relationship between the demographic component of the economy (in the context of the world's most pressing water-related issues affecting climate and energy migration) and the concept of the demoethical model of sustainable development in modern society. The demoethical model focuses on organizing activities to enhance sustainable development, particularly the demoethical model relevant to Society 5.0 and Industry 5.0 organizations.

By conducting a literature review and analysis, this study identifies key issues in the sustainable development of the demographic component of the economy based on the demoethical model and provides practical recommendations for stakeholders involved in digital transformation.

The conceptual and methodological foundation of this research is the article “Demoethical Model of Sustainable Development of Society: A Roadmap towards Digital Transformation” (Zhanbayev et al., 2023a), which presents a new concept in the contemporary literature review and aligns with President Kassym-Jomart Tokayev's address at the meeting of the Council of Heads of States-Founders of the Interna-

tional Fund for Saving the Aral Sea. The address highlighted that global climate change, the onset of a period of low water levels, and a lack of irrigation water pose a threat to the security of Central Asia.

This study (Zhanbayev et al., 2023a) argues that the concept of sustainable development is based on the priority of spirituality, as the foundation of a new stage or model of societal development, which involves integrating demographic, socio-economic, and ecological components into overarching modeling processes. One example is the impact of environmental changes on individuals and their ability to adapt using alternative means of existence. The abilities and opportunities of migrants differ, meaning that some benefit while others face significant challenges. Different people migrate differently in response to drought and water shortage. Migration processes vary based on gender, age, social status, and available resources. Numerous factors such as culture, political and economic circumstances influence population migration.

In recent years, empirical studies have identified population groups that either do not want or cannot engage in labor migration (Adams, 2016). The ability of these population groups to migrate may gradually decline over time, increasing the likelihood of a humanitarian crisis and the need for constant high-level intervention.

The Demoeconomics concept can be used for environment change adaptation, creating an anti-ecological buffer, as well as risk identification and prevent the effects.

Results

Climate migration in Central Asia

The region of Central Asia is located in the center of the Eurasian continent and includes 5 countries: the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, Turkmenistan, and the Republic of Uzbekistan. In Central Asia, climate change is characterized by increasing average temperatures, changing precipitation levels, and shifting extreme climate factors. The temperature increase in the region has been uneven (Table 1). The highest rates of increase in average annual air temperature are observed in Turkmenistan. In most of the territories of the Central Asian countries, the highest temperature increases occur in the spring period.

Table 1. Temperature growth trends (°C) in Central Asia for the period of 1976–2021

Central Asian Countries	Year	Winter	Spring	Summer	Autumn
Kazakhstan	0,32	0,19*	0,65	0,22	0,22*
Kyrgyz Republic	0,23	0,25*	0,46	0,12*	0,08*
Tajikistan	0,17	0,16*	0,30	0,03*	0,07*
Turkmenistan	0,37	0,47	0,48	0,38	0,20*
Uzbekistan	0,33	0,32*	0,55	0,31	0,16*

Note — Consolidated Annual Report on the State and Change of Climate in the territories of the CIS member states for the year 2021, Hydrometeorological Service, 2022

The increase in extreme maximum temperatures poses a threat to agriculture, health, transportation, nature, and water usage. The shift in precipitation from summer to spring, combined with an increase in the duration of droughts, reduces water reserves, increases demand for water, and leads to water scarcity. In all five countries of Central Asia, climate change is expected to continue rising. Throughout the twentieth century, the average rate of temperature increase compared to global rates will continue to rise. By 2100, the average annual temperature may increase by 2.6%, resulting in a rise of up to 3.3°C in the summer period, according to optimistic forecasts, and by 6.8°C (up to 8.7°C in the summer period) according to pessimistic forecasts.

According to international experts, the temperature in our region is increasing much faster than the global average. This is leading to a reduction in the area of glaciers — the main source of water in the Aral Sea basin. At the meeting of the heads of state of Central Asia on September 15, 2023, President Kassym-Jomart Tokayev noted that the volume of water resources in the Aral Sea has decreased by 30% over the past 50 years. By 2050, droughts in this region could cause damage equivalent to 1.3% of GDP per year, which could result in the emergence of approximately 5 million “climate” migrants in Central Asia. The region also faces problems of inefficient water use and ignoring environmental consequences. The degree of regulation of the two major rivers in our region, the Syr Darya and the Amu Darya, is extremely high. More than 80 reservoirs have been built in their basins, with a total volume of almost 65 cubic kilometers.

The drying up of the Aral Sea and, as a contributing factor, the intensification of wind erosion on its drying surface, are leading to global anthropogenic causes of climate change in the Central Asian region.

In addition to the drying up of the Aral Sea, another important specific factor affecting climate change in the region is the melting of glaciers and snow cover in the mountains, leading to desertification of the land. According to statistical data, the rate of glacier retreat in Central Asia ranges from 0.2 to 1% per year, which means that over the past 60 years, up to 30% of the Pamir and Tien Shan glaciers have melted.

Thus, an increase in anthropogenic pressure is expected, along with continued extensive land use and exacerbation of various socio-ecological problems. Kassym-Jomart Tokayev noted that when formulating water policies, states should consider that water is a limited natural resource, which directly affects the well-being and sustainable development of the entire region.

Energy migration of the EU.

After the EU agreed on a price ceiling for Russian oil, the cost of Brent crude oil fell below \$79 per barrel for the first time since January 2022. While Russian authorities consider possible responses to the EU's decision, energy prices for consumers, which had been steadily rising in 2022, have slightly decreased. However, since the beginning of July 2023, oil prices have started to rise again (above \$90 per barrel of Brent crude), which will have a negative impact on the citizens of the UK and the EU in the upcoming winter.

For example, the consortium of retailers in the UK specifies that there is a rise in prices caused by inflation due to the increase in electricity prices.

The average monthly salary in the UK, according to statistical data in August 2023, is £2,260, and the average energy bill in September 2023 will be around £2,000 per year. In Germany, the average monthly salary in August 2023 is €4,330, and the average energy bill per year is €3,568.

Olga Konovalova, Deputy Head of the Research and Development Department at the M.V. Lomonosov Moscow State University Center for Marine Research (Vecherova, 2022), notes that this type of migration is currently a common phenomenon and will only intensify in the future, as globalization provides individuals with diverse incomes and levels of prosperity the opportunity to migrate freely to different places at any frequency. There is a basic cost for services, and there is a cost for ecosystem services that individuals can obtain from the environment.

Kuznetsov (Vecherova, 2022) notes that in this situation it is necessary to start discussing the energy transition. Thus, over the past six months (from June to November 2022), there has been an almost six-fold increase in the procurement of solar panels in European Union countries, totaling more than €2.5 billion per month. "In a way, Europe has been trying very hard to prolong its prosperity, sacrificing economic growth. But the time has come to pay for the transition to new economic models. This transition will be painful but inevitable" (Vecherova, 2022).

Highlighting the economic consequences of the emerging and ongoing economic migration, statistical data shows the beginning of an economic crisis in the European Union. This is evident based on companies relocating to other countries and, including temporary relocation of citizens to warmer regions during the winter period (Vecherova, 2022).

Discussions

The correlation between Demography and the values of Demoethics

In accordance with SDG 13 (climate action and peace), the African Union aims to enhance regional resilience to the negative consequences of climate change. This requires a comprehensive transformation of society and its institutions.

Recent sociological surveys conducted by RPORC (Russian Public Opinion Research Center — VCIOM) and the National Energy Security Fund (Russia) indicate that the issue of climate change is becoming increasingly relevant to society. From the analysis of respondents' answers to the question "What environmental problems are currently relevant to Russia and require the most attention from the government", the Top-5 most pressing issues can be identified: water pollution, deforestation, growing landfills, air pollution, and plastic pollution (Fig. 1).

According to the conducted research, 43% of respondents believe it is necessary to combat climate change "from top to bottom", ensuring appropriate legislation and control over resource usage, while only 12% of Russians believe that each individual should reduce their consumption of various resources to combat global warming. 25% of respondents stated that the recent Covid-2019 pandemic was one of the reasons why they started paying more attention to ecology, and 29% of respondents expressed the opinion that people will pay more attention to nature after the pandemic.

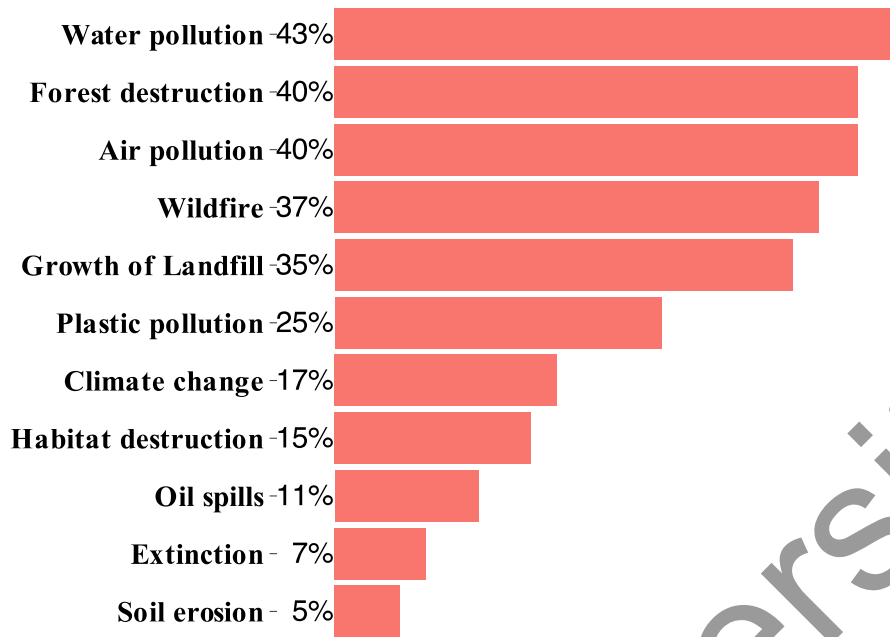


Figure 1. Current environmental issues

Note — source [Romir, 2020. URL: <https://romir.ru/>]

Regarding the population's attitude towards climate change, respondents noted (Fig. 2) that climate change is partly caused by natural processes and partly by human activity — 30%, climate change is mainly caused by human activity — 16%, and climate change is completely caused by human activity — 10%.

Thus, the ROMIR study (2020) demonstrates that almost half of the respondents are convinced that both the government and individuals should make more efforts to address the climate crisis.

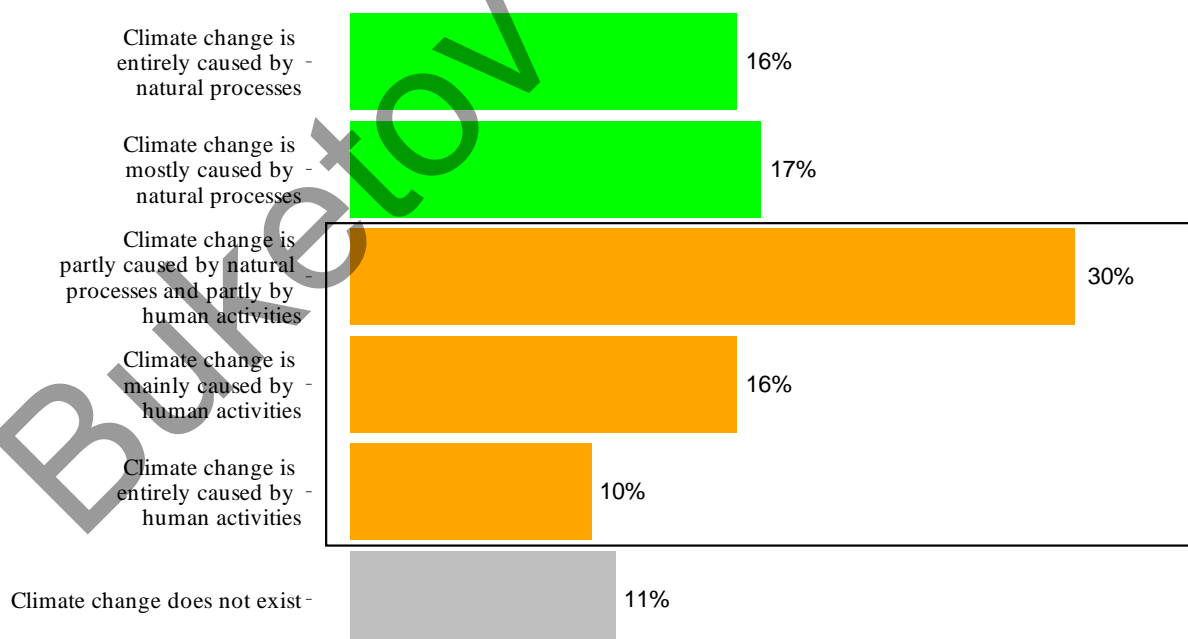


Figure 2. Causes of climate change

Note — source [Romir, 2020. URL: <https://romir.ru/>]

Climate change, which leads to a deteriorating quality of life, poses additional challenges to the socio-political system. It is evident that the loss of family members, personal health, and housing due to climate

change-related factors leads to tension in society. Climate factors (e.g., smog from natural wildfires) can exacerbate such complex political challenges for society and the state, similar to pandemics: scientists estimate that in certain cities in the US, Italy, and other countries, there is an increased mortality rate from the virus in cities with higher levels of air pollution.

However, the deterioration of quality of life due to direct impact is not the only factor creating additional turbulence for any socio-political system. As global experience shows, worsening climate conditions can lead to additional migration and exacerbate social conflicts due to the rapid mixing of different subcultures and ethnic groups as a result of forced migration.

The world is changing rapidly and often unpredictably. Therefore, it is necessary to note that without addressing social and environmental issues, economic sustainability cannot be achieved in any country. The interpretation of sustainable development entails ensuring social balance within society, protection of the environment, and economic efficiency in the interconnectedness of governments, business, and society, taking into account the interests of all stakeholders. One of the many systemic transformations aimed at changing the current reality is the implementation of the United Nations Sustainable Development Goals (UN SDG) (Zhanbayev et al., 2022).

In order to achieve SDG 13 (climate action and its impacts), SDG 6 (provide access to water and sanitation for all), SDG 7 (ensure access to affordable, reliable, sustainable, and modern energy), SDG 3 (ensure healthy lives and promote well-being for all), and SDG 11 (make cities and human settlements inclusive, safe, resilient, and sustainable), measures are proposed for developing the demography component. Migration is an objective process that should be managed using government regulatory mechanisms, actively utilizing the tools of Demoethics and digitization in relation to water, climate, and energy policies of the state.

Migration is an objective process that should be managed with the help of state regulation mechanisms, actively using the tools of demoethics and digitalization in relation to water, climate, and energy policies of the state.

Climate change is caused by human activity and threatens life on Earth as we know it. Further inevitable deterioration of the environment will lead to increased migration flows from Central Asian countries. In the ranking of vulnerability to climate change compiled by the World Bank, Tajikistan ranks first among all countries in Eastern Europe and Central Asia, Kyrgyzstan is in third place, Uzbekistan is in sixth place, and Turkmenistan is in seventh place.

The fight against climate change should be carried out, first of all, by the state, creating a legislative framework (Zhanbayev et al., 2023b) based on the concept of Demoethics values and ensuring control over the use of natural resources. Unfortunately, the formation of public demand for environmental modernization faces a number of problems caused, among other things, by the imperfection of state climate and environmental policy. We consider Demoethical Communication Management in the context of implementing measures to prevent worst-case climate scenarios and introducing new climate policies as the most effective tool at the present time.

Thus, the values of Demoethics contribute to the adaptation of society to negative consequences, being a tool of stabilization in the conditions of the new climate reality, which is currently being formed and affects all countries existing today.

The practical implementation of the research is provided by Demoethics, as a new model for the transformation of society in the context of the global climate crisis.

The proposed developed paradigms of Demoethics values, such as demography, democracy and demoeconomics, can play an important role in the implementation of the Sustainable Development Goals and, as a result, ensure the quality of life and competitiveness of the population.

This study examines the issues of the economic component — demography, using Demoethic values such as “spirituality and morality”, “responsibility”, “justice”, “rationality”, and “security” to create favorable conditions for improving demographic indicators, which are presented in Table 2.

One of the key concepts of the Demoethic approach is the value (“spirituality and morality”, “responsibility”, “justice”, “rationality”, and “security”). In our research, we have determined that the key organization responsible for the well-being of the economy and society is responsible for creating and implementing values in sustainable development.

Table 2. Demoethics Values Paradigm as a Tool/Mechanism for Sustainable Implementation of Interaction with Demography Components

Values of Demoethics	Characteristics of Demoethics values
Spiritual-moral	<p>The influence of the “spiritual and moral” aspect on the demographic indicators of society can be very great in various circumstances:</p> <p>People's ethical and moral beliefs can influence how they decide important life issues: getting married, having children, and raising children. In those societies where marriage and family are valued, spiritual and moral values help preserve the family in difficult moments, and also, as a rule, set people up to give birth and raise as many children as possible. Thus, spiritual and moral values contribute to an increase in the birth rate and an increase in the population.</p> <p>Spiritual and moral attitudes can also influence the decision to terminate a pregnancy (abortion). In countries with strong religious traditions, where abortion is prohibited due to national or religious beliefs, the number of abortions is much lower compared to societies where these traditions are less significant.</p> <p>Moral values and spiritual culture may still influence the aging population and overall life expectancy. In countries where caring for elderly parents is valued, young people are more likely to take on this responsibility, and accordingly, life expectancy there increases.</p>
Responsibility	<p>“Demographic responsibility” plays an important role in the sustainable development of society under the following circumstances:</p> <p>Socio-economic sustainability: When a society has a stable economic and social environment, people feel more confident about the future and are more likely to be demographically responsible. They are much more likely to plan and have children, not just one, but several, as well as take care of their health, provide decent upbringing and education.</p> <p>Access to Resources and Services: When governments and business communities provide their citizens with quality access to social services such as health care, education, housing and a standard of living, people are more likely to engage in responsible parenting and parenting. Having the support and necessary resources helps them meet the needs of their family and create favorable conditions for giving birth and raising their heirs.</p> <p>Social values and norms: Cultural and social factors greatly influence demographic responsibility. In some societies, the state may encourage demographic responsibility through government programs to provide social support to families with children or through measures to stimulate the birth rate. In addition, public opinion and norms also play a role in shaping people's behavior regarding having and raising children.</p> <p>Examples: In some developed countries, such as Sweden and Norway, high levels of demographic responsibility are associated with wide access to social services, gender equality and low levels of poverty. These societies actively support families with children by providing a wide range of child benefits, parental leave and child care.</p> <p>Other countries, such as Japan and Germany, are facing declining birth rates and an aging population. In such circumstances, governments implement measures to stimulate the birth rate to cope with demographic challenges, such as providing maternity capital, preferential conditions and support for kindergartens. This is an example of demographic responsibility on the part of the state.</p>
Justice	<p>Demographic equity is an important aspect of social justice and is often the focus of government policies and programs at the national level to build a more equal and just society.</p> <p>Several demographic trends have emerged during the Covid-19 pandemic that can be considered in the context of demographic justice:</p> <p>Fertility: Many countries have seen a decline in their birth rate during the pandemic. This may be explained by stress, economic uncertainties and restrictions, and the immediate effects of the disease on pregnant women. This aspect affects demographic justice, since a decrease in the birth rate can lead to increased demographic inequality and an increase in the problem of population aging.</p> <p>Mortality: Covid-19 caused more serious consequences in older people and people with certain medical conditions than in younger and healthy people. This has led to a significant increase in mortality in these population groups. Demographic justice requires ensuring access to health care, support and protection for vulnerable groups.</p> <p>Migration: The pandemic has also affected international and domestic migration flows. The introduction of restrictions on the movement of people and the closure of borders led to a decrease in migration. At the same time, vulnerable groups such as refugees and migrants found it more difficult to access health care and social protection. This contributed to the violation of demographic justice.</p> <p>Overall, demographic equity has been at risk during the Covid-19 pandemic due to declining fertility rates, increased mortality among vulnerable groups, and restrictions on migration. Ensuring equal opportunities and protection for all groups of the population has been an important aspect of demographic justice in the field of demographic processes during the Covid-19 pandemic.</p>

Values of Demoethics	Characteristics of Demoethics values
Rationality	<p>Demographic rationalities are a concept associated with the rationale and making of decisions that are based on the demographic characteristics and characteristics of a particular population group. Various social, economic and cultural factors can influence such rational decisions. Demographic rationalities in society include the following aspects:</p> <p>Fertility and family policy: Currently, in many developed countries there is a decline in fertility and an aging population, so it is necessary to apply rational and thoughtful solutions that will be aimed at supporting families and stimulating fertility (for example, subsidies for children's goods and services, benefits for young families, increase in maternity leave).</p> <p>Western European countries such as Sweden and Norway have legislated family support policies, including parental leave for both parents, subsidies for child care and other measures.</p> <p>Japan and Germany are developing and implementing programs aimed at increasing fertility, such as financial incentives for young families and support for women who do not want to continue their careers. The general goals of demographic rationality include understanding the needs and requirements of different demographic groups in order to develop appropriate policies and programs.</p> <p>Population aging: In societies where the ratio of the elderly population to the working population is high, there is a demographic rationality in decision-making aimed at improving the living conditions of older people. For example, the development of infrastructure, social protection and medical care for the elderly population.</p> <p>Youthful population: In countries with young populations, decisions related to education, health care and job creation for young people will be demographically rational. For example, developing the education system, ensuring access to quality medical care and promoting youth entrepreneurship.</p> <p>Migration: In societies with high levels of international migration, rational decisions may be related to the development of migration policies and the integration of migrants into society. For example, creating support and adaptation programs for new migrants, as well as taking into account the importance of intercultural dialogue and promoting the inclusion of migrants into society.</p> <p>Many countries attract foreign workers to fill labor shortages in certain industries. Thus, in the countries of Western Europe and North America in recent decades, programs have been introduced to help attract skilled workers from other countries, which has led to an increase in the number of migrants. This can have both positive and negative impacts on fertility and family policies in receiving and sending countries.</p> <p>Conflicts and humanitarian crises arise in various regions of the world, resulting in people being forced to leave their home countries in search of security and stability. A country's acceptance of refugees may affect demographics due to changes in population structure and cultural differences.</p>
Security	<p>The "security" aspect can influence the demographic indicators of society as follows:</p> <p>Military Conflicts: Military actions typically result in deaths, displacement, and destruction of social and economic infrastructure. This, in turn, provokes a decrease in the birth rate and an increase in mortality, which affects the demographic indicators of society.</p> <p>Crime and Violence: High levels of crime and violence can have a negative impact on the demographics of a society. Due to rising crime rates, people are forced to leave their homes and countries. This leads to increased migration and negatively affects the birth rate and mortality rate.</p> <p>Disadvantage and Poverty: Disadvantage and poverty often prevent people from accessing basic health services, education and social programs. This leads to an increase in diseases, poor health, high mortality and low birth rates, which negatively affects the demographic indicators of society.</p> <p>Examples: During the Syrian civil war, many people were forced to leave their homes and country due to hostilities. This led to an increase in migration and negatively affected the demographic indicators of Syria.</p> <p>In some cities with high crime rates, such as Caracas in Venezuela, violence can lead to high death rates and decreased birth rates. This negatively affects the demographic situation in the city.</p>
<p><i>Note — (developed by the authors): the proposed preliminary results of applying the values of Demo-ethics to the demographic component of the economy will be improved within the framework of the study</i></p>	

Conclusions

Technological transformation is one of the key solutions for managing economic, environmental, and political risks. The current situation with climate change, as well as the plans of other countries, require a radical transformation of Kazakhstan's socio-economic development and the establishment of new relationships with foreign partners based on dialogue on climate issues and technological modernization.

The current situation seems to have deeply undermined people's trust and faith in the data economy, its practices, and players (Rantanen, 2019). This lack of trust and its consequences — information exchange limitations and data falsification — threaten data collection and, therefore, the entire foundation of the data economy (Punj, 2019). Thus, a new human-centered and transparent approach to the data economy is necessary to overcome the lack of trust and risks to an ethical society (Koskinen et al., 2017). Therefore, our re-

search raises questions about Demotic values and a human-centered model of sustainable development, demotic management of the demographic component of the economy in the context of climate and energy migrations.

In addition, the “Low Carbon Transformation of the Economy”, based on the values of demo-ethics, will allow to avoid economic crises and political risks in the future society or minimize them, and most importantly, prevent already manifested unethical consequences by respecting the rights of citizens, including the right to a favorable environment.

Following the strategic goals and based on the values of Demoethics, actions should be directed towards creating favorable conditions in the most vulnerable sectors of the economy:

- 1) Water resources
- 2) Energy
- 3) Agriculture and land use
- 4) Healthcare
- 5) Natural ecosystems and biodiversity
- 6) Reducing the risks of “climate-dependent natural disasters”.

Within the framework of achieving the Sustainable Development Goals (SDG), the country, civil society, and international institutions have taken on commitments for the period until 2030 to fulfill a whole range of tasks — from reducing extreme poverty to ensuring environmental sustainability and universal education, reducing child mortality, and promoting gender equality. Despite the fact that adaptation activities directly contribute to the achievement of SDG 13, aimed at taking measures to combat climate change, it should be considered as part of a strategy to consolidate the achievements of countries in implementing all other SDG based on the value of Demoethics.

We expect that the results of this study can be useful in supporting targeted policies and the transformation of demographic components of the economy.

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Gratitude

In scientific work based on the principle of transdisciplinary research, a constructive dialogue was conducted between specialists from different fields, which contributes to the transformation of other components of the economy. Scientists were included as co-authors of the article in order to acquire new knowledge in the field of sustainable development goals formation.

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**Климаттық және энергетикалық көші-қон және су тапшылығы контексіндегі
демографиялық процестердің демоэтикалық құндылықтарымен қоғамның
тұрақты даму байланысы**

Аңдатпа:

Зерттеудің мақсаты — қоғамның тұрақты дамуын өзгерту құралы ретінде су ресурстарымен, климаттық, энергетикалық көші-қонмен және демоэтикалық құндылықтармен байланысты әлемдегі ең өткір мәселелер контексіндегі демографиялық процестердің өзара байланысын зерттеу.

Әдісі: Мақалада демографиялық, әлеуметтік-экономикалық және экологиялық компоненттерді жалпы жүйелік модельдеу процестеріне біріктіруден тұратын қоғамның тұрақты дамуының жаңа кезеңінің немесе жаңа моделінің негізі ретінде руханияттың басымдығына негізделген демоэтика тұжырымдамасы қолданылды.

Қорытынды: Ұсынылған тәсіл тұрақты дамуды жақсарту жөніндегі қызметті ұйымдастыруға бағытталған. Атап айтқанда, Қоғам 5.0 мен Индустрия 5.0 ұйымдары үшін маңызды болып табылатын демоэтикалық модель ұсынылған. Әдебиеттерді шолу және талдау арқылы бұл зерттеу этикалық үлгі негізінде экономиканың демографиялық құрамдас бөлігінің тұрақты дамуының негізгі мәселелерін анықтайды және цифрлық трансформацияға қатысатын мүдделі тараптар үшін практикалық ұсыныстар береді.

Тұжырымдама: Елдің тұрақты даму саласындағы мақсаттарға (ТДМ) қол жеткізу шеңберінде азаматтық қоғам мен халықаралық институттар 2030 жылға дейінгі кезеңге аса кедейлік көрсеткіштерін қысқартудан бастап экологиялық тұрақтылық пен жалпыға бірдей білім беруді қамтамасыз етуге, балалар өлімін қысқартуға және гендерлік теңдікті қамтамасыз етуге дейінгі міндеттердің тұтастай спектрін орындау бойынша өзіне міндеттемелер қабылдады. Бейімделу қызметі климаттың өзгеруіне қарсы күрес шараларын қабылдауға бағытталған ТДМ 13-ке қол жеткізуге тікелей ықпал ететініне қарамастан, оны демоэтика құндылығына негізделген барлық басқа ТДМ-ны жүзеге асыруда елдердің жетістіктерін бекіту стратегиясының бөлігі ретінде қарастыру қажет.

Күтілетін нәтижелер: Осы зерттеудің нәтижелері мақсатты саясатты қолдау және экономиканың демографиялық компоненттерін трансформациялау үшін негіз бола алады.

Кілт сөздер: тұрақты даму мақсаттары (ТДМ), тұрақты даму, демоэтикалық құндылықтар, климаттық көші-қон, энергетикалық көші-қон, Орталық Азияның қауіпсіздігі, су ресурстары, өмір сүру сапасы, трансформациялау.

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С.С. Сагинтаева, М. Садыкова**

**Взаимосвязь демографических процессов с демоэтическими ценностями
устойчивого развития общества в контексте климатической и энергетической миграции
и нехватки воды**

Аннотация:

Цель: Цель исследования заключается в изучении взаимосвязи демографических процессов в контексте наиболее острых мировых проблем, связанных с водными ресурсами, с климатической, энергетической миграцией, и демоэтических ценностей как инструмент трансформации устойчивого развития общества.

Методы: В работе использована Концепция демоэтики, базирующаяся на приоритете духовности, как основы нового этапа или новой модели устойчивого развития общества, которая заключается в интеграции демографической, социально-экономической и экологической составляющих в общесистемные процессы моделирования.

Результаты: Предлагаемый подход фокусируется на организации деятельности по улучшению устойчивого развития. В частности, представлена демоэтическая модель, важная для организаций Общества 5.0 и Индустрии 5.0. Посредством обзора и анализа литературы данное исследование определяет ключевые вопросы устойчивого развития демографического компонента экономики на основе демоэтической модели и предоставляет практические рекомендации для заинтересованных сторон, участвующих в цифровой трансформации.

Выводы: В рамках достижения Целей в области устойчивого развития (ЦУР) страны гражданское общество и международные институты на период до 2030 года приняли на себя обязательства по выполнению целого спектра задач — от сокращения показателей крайней бедности до обеспечения экологической устойчивости и всеобщего образования, сокращения детской смертности и обеспечения гендерного равенства. Несмотря на то, что адаптационная деятельность напрямую способствует достижению ЦУР–13, направленной на принятие мер по борьбе с изменением климата, ее нужно рассматривать как часть стратегии по закреплению достижений стран в осуществление всех других ЦУР на основе ценности демоэтики.

Ожидаемые результаты: Результаты данного исследования могут послужить основой для поддержки целенаправленной политики и трансформации демографических компонентов экономики.

Ключевые слова: цели устойчивого развития (ЦУР), устойчивое развитие, демоэтические ценности, климатическая миграция, энергетическая миграция, безопасность Центральной Азии, водные ресурсы, качество жизни, трансформация.

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