

## MODERN TECHNOLOGIES TO OVERCOME THE CHALLENGES OF GLOBALIZATION

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### Abstract

*Civilized humanity should strive to live in a society based on justice, prosperity and humanism. At the present stage of globalization, achieving this goal requires the rational use of existing natural, civilizational and institutional resources. Population is a phenomenon that defines everything to which everything is connected. The growth of the world population is closely related to the development of technology, causes it and is affected by it. Using modern technologies, it is possible to adequately meet the growing needs of people for food and other livelihoods. The following are important for ensuring Georgia's strategic security: diversification of the economy, reasonable reduction of economic dependence on neighboring countries; more efficient use of the country's transit function; Use the real prospect of becoming a candidate country for EU membership; Accelerate the integration of the country's economy with the West, Asia and all other civilized countries.*

**Keywords:** *population growth; technological revolution; growing demand for food; state thinking; digital education*

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### 1. Introduction

The history of civilization is the history of the pursuit of a better future for mankind. To do this, each person must aim to live in a society based on justice, prosperity and humanism. Achieving this goal requires the rational use of existing natural, civilizational and institutional resources. There is no doubt that world

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population growth is closely linked to the development of technology. They give rise to new economic ideas and are influenced by them.

As a result, we must analyze all of the positive and bad elements of these processes, including the change and influence of various sectors of the economy. Alongside these processes, international organizations such as the European Union (Frey & Osborne, 2017), the OECD (Furman & Seamans, 2018), and the OSCE (Frontier Economics, 2018) have begun to establish appropriate regulatory institutions and guidelines, as they have in most developed countries such as the United States (Columbus, 2017), Germany (De Backer et al., 2018), Spain (Frankfurter Allgemeine, 2016), Sweden (European Parliamentary Research Service, 2019), and others. The study examines the function of artificial intelligence systems in helping businesses adjust to changing economic realities. Furthermore, the need of scientific research and increasing financing in these areas is emphasized (Abuselidze & Mamaladze, 2021; Aggarwal, 1999; Bremmer, 2014; Cardoso, 2009; Clark, 1967; Cohen, 2000; Columbus, 2017; Fogel, 1999; Frey & Osborne, 2017; Furman & Seamans, 2018; Future of life Institute, 2019; Goldin & Reinert, 2012; Kellner, 2002; Steger, 2017; Vollset et al., 2020; Zeleny, 2012).

## 2. Population growth and technological progress

The current processes in the modern stage of globalization also affect the development of humanity. Its results lead to quantitative and qualitative changes. This applies to both individuals and the community, which may have a positive or negative impact (Veshapidze et al., 2015). All global problems are related to population size and its sex-age structure. For example, demographic explosions are associated with the development of uninhabited areas of the world, numerous local and two world wars... And for the demographic explosion, the impetus is new technologies. Population growth and technology development are closely linked and conditioned. Their relationship is shown in Table 1.

*Table 1. Population growth and known events in the history of technology*

Date: Century, years	Population	Famous events in the history of technology
<b>-9 000</b>	5 000 000	The beginning of the first agrarian revolution
<b>-1 000</b>	50 000 000	
<b>-500</b>	100 000 000	Flourishing of ancient Greece
<b>-400</b>	120 000 000	
<b>-200</b>	180 000 000	
<b>0 or 1</b>	300 000 000	Flourishing of ancient Rome
<b>700</b>	310 000 000	
<b>800</b>	330 000 000	
<b>900</b>	360 000 000	

<b>1000</b>	400 000 000	The beginning of the second agrarian revolution
<b>1200</b>	500 000 000	
<b>1600</b>	600 000 000	
<b>1700</b>	770 000 000	
<b>17th century</b>	-	The discovery of microorganisms, the beginning of the Industrial Revolution
<b>1750</b>	855 000 000	
<b>1800</b>	1 000 000 000	
<b>18th century</b>	-	Conduct the first attempt at artificial vaccination against „The flower“.
<b>1850</b>	1 265 000 000	
<b>1900</b>	1 656 000 000	
<b>19th century</b>	-	The discovery of electricity, the lighting of the first lamp, the advent of railways, the invention of the telegraph, the telephone, the automobile, the discovery of DNA.
<b>1925</b>	2 000 000 000	
<b>1950</b>	2 555 974 605	
<b>1970</b>	3 711 961 664	
<b>1980</b>	4 452 547 522	
<b>1990</b>	5 283 687 429	
<b>2000</b>	6 083 550 220	
<b>20th century</b>	-	The invention of the airplane, the car assembly line, the advent of television broadcasting and Internet television, the invention of the penicillin, the construction of a nuclear-powered nuclear reactor, the human landing on the moon, the fight against malaria, the invention of the computer and its improved mouse, the first Creation of automated cellular network systems (0G, 1G, 2G); Successful implementation of the project "Human Genome".
<b>2010</b>	6 830 586 985	3G and 4G technologies
<b>2020</b>	7 557 514 266	5G technologies
<b>2030*</b>	8,202,205,367	
<b>2050*</b>	9,202,458,484	
<b>2075*</b>	9,300,000,000	
<b>2100*</b>	8,400,000,000	

*Source:* Compiled by the authors based on the following data: 1. Population Reference Bureau, 2008; 2. United Nations Department of Economic and Social Affairs, Population Division, 2008; 3. U.S. Census Bureau, International Data Base, 2010; 4. Fogel, 1999

Development and growth in the world began only in the 18th century, after the discovery of the New World, the Second Agrarian Revolution and the Industrial Revolution. Europe, the United States, Canada, Australia and New Zealand have embarked on a path of purposeful and sustainable economic development, creating a growing gap in wealth between these countries and the rest of the world. It is no coincidence that the "political economy" flourished just when European countries began to develop sharply (Gvelesiani & Veshapidze, 2016a; 2016b). With the

development of new technologies, humanity has gone through a new path of development that continues today.

New technologies in medicine have reduced mortality and increased the food base of the population in the agricultural sector (Zoidze, 2020a). At the same time, demographic growth inequality has led to technological, military, and economic inequality (Veshapidze & Zubiashvili, 2021). This would be followed by an attempt to redistribute power and resources between countries and peoples (Zoidze, 2021b).

In the economic literature - fundamental changes in technology that lead to fundamental transformations in economic relations and in the life of society as a whole - there is talk of industrial or technological revolutions (Table 2).

*Table 2. Industrial Revolutions*

<b>№</b>	<b>Revolutions</b>	<b>The Main Source of Growth</b>
<b>I</b>	1770–1860: The 1st Industrial Revolution - The era of steam and grinder production	Steam machine, Grinding machines, Metallurgy, Lathe...
<b>II</b>	1860–1900: The 2nd Industrial Revolution - The era of steel and mass production	Telegraph, Railway, Internal Combustion Engine, Conveyor...
<b>III</b>	1970-2010: The 3rd Industrial Revolution - The Age of Computers	Computers, Electronics, Atomic Energy, Robots...
<b>IV</b>	2010-2060: The 4th Industrial Revolution - The Age of Cyberphysics and the Internet	NBIC - Technology, Genetic Engineering, 3D Printers, RES, Drones, Online Subscription...

*Source:* Compiled by the authors based on the following data: 1. Schwab, 2017; 2. Schwab & Malleret, 2020

During the first three revolutions, hard physical labor was gradually replaced by machines. The fourth industrial revolution is already replacing human labor, replacing it with robots of high artificial intelligence (Zoidze, 2021a). To commemorate the 4th Industrial Revolution, the term "Industry 4.0" appeared, which was widely used at the Davos Economic Forum in 2016, thanks to a monograph by the forum's founder, G. Schwab. The fourth industrial revolution began in 2010 and will last until 2060. It is called the age of cyberphysics and the Internet. As a result, the main sources of economic growth in this period are considered to be NBIC - nano, bio-, info-, cognitive technologies, genetic engineering, 3D - printers, RES - renewable energy sources, drones, subscription to items via the Internet (Schwab, 2017).

The world population is growing at a rapid pace. There is a birth rate boom in many countries. Today the world population already exceeds 7.8 billion people. The population is projected to exceed 9.7 billion by 2050 and 10.9 billion by 2100. Therefore, the world is facing a big challenge: the food demand of the growing

population must be met against the background of limited resources (Otinashvili, 2021a). Given this, the question arises, to what extent will all this be possible?

The annual increase in demand for food is due to the following reasons:

1. World population growth;
2. Improving the material condition;
3. Economic development, etc.

Increased demand for food gives incentives to producers to increase their production capacity, to produce even more food. In order to produce more food, more agricultural land is needed, due to which a huge area of forests is cut down every year, which further worsens the ecological condition. The world seems to be facing a dilemma: either it must provide the world population with a sufficient amount of food, or it must take care of the ecology. That is, it turns out that any choice is unprofitable.

### **3. Population Welfare, Education and the Global Hunger Index**

Thomas Robert Malthus, an 18th-century British philosopher and economist, developed the theory of population. According to this theory, Malthus was concerned with the dangers of world reproduction. If anyone needs to express the essence of the teachings of Thomas Malthus in one sentence, we must use wise sayings: "If you do not want to destroy a person, do not set him on fire every day". Or, a Chinese proverb: "If you want to help a hungry person, give him a rod instead of a fish and teach him to fish." They most accurately convey the main position of Malthus's concept: there is no need to embrace a person with constant support, as this weakens him and makes it difficult for him to deal with the harsh challenges of the outside world.

Malthus's theory states that food production lags behind population growth and it will not be able to sustain a human population while maintaining its well-being. He prophesied that this would result in disease, famine, war, and calamity. Many of Thomas Malthus's statements, of course, can not be accepted, but the undermining of man's dependence on the environment is his undoubted merit. It derives directly from human needs for livelihoods. It is also very important that Malthus draws the attention of researchers and the general public to population growth indicators and raises the question of its regulatory capacity.

The Global Hunger Index is used to measure hunger levels based on various indicators. By setting this figure, attention is paid to those areas of the world where the hunger threshold is very high. This index indicates in which region or country additional efforts are needed to eradicate hunger. To calculate the index, 4 indicators are defined in each country: malnutrition; Childhood illness; Growth retardation in children; Child mortality. The Global Hunger Index "0" is the best indicator, and "100" is the worst indicator. By region, the highest rates of global hunger are recorded in South Asia and sub-Saharan Africa. This is due to the high rate of all four indicators. Low or moderate rates of hunger are observed in Eastern Europe, Latin America and

the Caribbean, Southeast Asia, East and North Africa (The Concept of the Global Hunger Index, 2021).

By countries, according to the 2019 Global Hunger Index, 43 countries have the worst hunger situation. The situation is alarming in the Central African Republic, Chad, Madagascar, Yemen and Zambia. The unfortunate situation is due to hunger and malnutrition in Burundi, the Comoros Islands, the Democratic Republic of the Congo, Eritrea, Libya, Papua New Guinea, Somalia, South Sudan and Syria. The hunger rate is particularly high in the countries listed. Haiti and Nigeria are not only the most vulnerable countries in this respect because of hunger, but also because of the severe impact of climate change.

In such regions and groups that require special approach and care, governments and donors should invest in and support agricultural development. They need to make access to a wide range of services, resources and markets accessible to farmers. A strategy for adapting to climate change should be developed in agreement with the communities and taking into account local needs.

We need to be better prepared for accidents. To reduce the risk of disasters, the involvement of donors and governments should be increased in the following areas, which include early warning and response system operation, maximum operation of the weather forecasting mechanism and the availability of appropriate infrastructure (Otinashvili, 2021b). It is necessary to correct the food system and unequal condition. Transformations must be made in the production and consumption of products. Particularly in high-income countries, it is important to develop mechanisms to reduce emissions and make healthier products available to humans. Governments should support the operation of a sustainable product production system, which means avoiding food loss as much as possible.

Malthus's prediction did not come true. There are many reasons for this. First of all, this is a feature of population reproduction. This implies that over time, population growth slows in the wake of improving economic and social conditions. The second reason is technological progress. Developed science, computer field, medical field, food production technologies. It is now possible to produce food much more efficiently than it was in Malthus's time, or as Malthus imagined.

Another reason for the collapse of the Malthus theory is the process of reassessment of values by humanity: people become more focused on their careers, development, they plan in advance to start a family, the number of children, no longer marry prematurely, etc., which Malthus also considered expedient. This process of reevaluation of values has long begun and continues to this day in developing countries. It is just a matter of time before every country sets its sights on a new world agenda.

In 2020, a new study appeared in the journal *The Lancet*. The world population is projected to reach a peak of 9.7 billion people by 2064. Then it will start to decrease and by 2100 - it will decrease to 8.8 billion. So far the population is still growing. Which poses great challenges to humanity. For example, how to meet the food needs

of more than 9 billion people by 2064? - Many people and many organizations are working on this topic. It is possible to give a convincing answer to it by implementing adequate technological advances (The Lancet, 2020).

It is important to implement new agricultural technologies, which will help increase production capacity and reduce costs. A farmer equipped with modern electronic technologies can significantly increase his labor productivity, work much more efficiently, less harmful to the environment. He can reduce the rate of world hunger by his own labor.

Throughout history, at every new stage, mankind has constantly expressed dissatisfaction with the state of affairs in education and asked the question - what should be education today and how should it develop in view of the requirements of tomorrow. The process of search, as well as the development of humanity itself, is uninterrupted, and those who are obsessed with reformist ideas are often forgotten, not the "subject" or "object" of education, but the person for whom this system was created - man.

First of all, education will increase a person's productivity and qualifications, which will eventually lead to an increase in the level of wages. The more educated a person is, the greater his potential to find a job, earn a high stable income, and move to a higher standard of living.

At the end of 2019, a wave of coronavirus pandemics started in the world. The pandemic has put the whole world in front of a big problem, which besides human health is also an economic side (Zoidze, 2020b). The world economy has suffered the greatest losses. Millions of people were left temporarily or permanently unemployed. More than 100 million people are on the brink of extreme starvation. Of course, the pandemic affected education as well. Most countries have switched to distance learning, including Georgia (Veshapidze & Zoidze, 2021).

It is clear that the coronavirus pandemic is a terrible thing for the world, but, it has had at least one positive result. We have seen how countries are ready to suddenly change the rhythm of ordinary life. In terms of education we have the opportunity to gain distance learning experience.

We live in an age of truly revolutionary challenges, risks, as well as advantages of digitalization, which in its significance can be freely compared to the industrial revolution that took place 200 years ago. Digitization at its own pace, with its own challenges, is important for the future development of educational disciplines.

It is also very important that the professional qualifications of the representatives of different fields themselves take into account the requirements of digitalization as much as possible in the process of receiving education. Only an institution that is maximally involved in such networks can be successful today, which is not only distinguished by purely professional approaches, but also it can overcome existing challenges through networked approaches together with other sectors of society.

Digitization is a comprehensive process that covers all aspects of social life, from everyday relationships to our professional activities and digital money (cryptocurrency) (Abuselidze & Zoidze, 2021). Digitization should be seen as a challenge that involves many risks but also offers many opportunities. How we use these opportunities depends on the diligence of us, as all groups in society, on a realistic perception of the challenges we face during the dynamically ongoing processes. Therefore, we should look at it only as a challenge and integrate this challenge as much as possible in the process of our daily activities.

The role of the state in education is also noteworthy. The state has motives to be actively involved in the education process and to fulfill its educational functions with appropriate levers and reforms, to ensure the growth of the education level of the population and thus to develop the economic and social side of the country (Veshapidze et al., 2021).

Covid-19 and The War in Ukraine posed great changes and challenges to the world economy and international economic relations. The political and economic situation in the Black Sea region has intensified. This is manifested primarily in the fact that oil and oil products have become more expensive; Due to the coronavirus pandemic, already high inflation has risen again (Zoidze & Abuselidze, 2021); In the stock market, the price of securities fell by about 10%. This conflict has a much greater negative impact on the Georgian economy. This refers to the reduction of remittances from abroad, the export of Georgian products to Russia and Ukraine, etc. Due to the state of war, the ports are closed. Consequently, products cannot be imported from Ukraine. As the main suppliers of wheat in Georgia are Ukraine, Russia and Kazakhstan, markets in this area should be differentiated, which is associated with additional costs. In such conditions, the main task is to ensure the security of each citizen of the country, their own families (Basilia, 2022).

Therefore, it is important to intensify relations with neighboring countries - Turkey, Azerbaijan, Central Asian countries. They have oil products, wheat and etc. Transportation and import are easily possible with Romania and other EU countries.

#### **4. Conclusion and Recommendations**

The rapid growth of the world population and the modern threats to sustainable development - local conflicts, wars, the COVID-19 pandemic, the Russian war in Ukraine - have posed challenges to human well-being. Many countries are facing the threat of severe food shortages and famine. Georgia needs to strengthen state thinking. This means protecting Georgia's national interests in energy, food, economy and all other areas as much as possible. It is important that the country is based on stable state institutions in the long run.

As Georgian public figure Ilia Chavchavadze said, his country's first priority should be "serving the people." This means ensuring the political, economic, social development of the state, and protecting human rights. In fact, the first priority areas

should be implemented: macroeconomic stability; Increase in production; Import diversification; Improving the country's guaranteed food supply; Full use of geopolitical space, maritime and transport corridor, comprehensive promotion of transport potential; Attracting foreign investment (especially from Western companies).

We should not allow Georgia to be used to circumvent the sanctions imposed by the countries of the world community. It is also important to employ middle- and high-skilled immigrants in the country, to conclude free trade agreements with all strategic partners, to ensure peace, security and stability.

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