



# Horizon 2030 Demographic Tendencies in Bulgaria

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## 1. Abstract

Although the demographic situation in Bulgaria has been a serious crisis for nearly 30 years, it has only been the subject of public debate in the last few years and it has been said that steps need to be taken to improve it. However, this debate is pursued in several erroneous directions; the focus and the measures taken are not related to the most significant problems and this leads to a lack of results. We constantly talk about our low birth rate, the decreasing number of babies born in absolute terms each year and the aging of the population. Yes, they are a fact, but it is not these aspects that are the main problems, because in terms of the total fertility rate (the average number of children of a woman of childbearing age), Bulgaria with its rate of 1.4 fits normally in the values of European countries where this rate varies between 1.1 and 2. In the last few years, fewer infants have been born in absolute terms (2017 - 56,436), but this is normal, since the generation that is now of childbearing age was born in the 1990s, when Bulgaria was already in a demographic crisis, i.e. the child-bearing contingent of the population is shrinking all the time, a fact to which, of course, the continuing emigration of people of active age also contributes. Bulgaria is certainly among the most aging nations, not only in Europe, but indeed in the world. And it is also the only state in all human history, in which the largest cohort of the population of one of the sexes (female) is already of retirement age (60-64). But here we are witnessing a demographic paradox, rather than a real problem of aging. This is because we have one of the lowest average life expectancies in the EU (74.7 years), and the most aging population. This fact is due to the drastic vertical demographic imbalance in the ratio of young (up to 29 years) compared to old (over 60) of the population.

And this is where we come to the main demographic problem of Bulgaria, which is related to the continued constant emigration of educated and qualified people of an active age (18-50). Thus, when talking about demography in Bulgaria, we need to talk about one main thing, namely the retention of young people in the country. It would not be serious to expect a sharp rise in birth rates; even reaching

a two-tier family model through financial incentives is not realistic and is not the way to solve our problems. But if we manage to keep our young people in the country, regardless of how many children they have, this will lead to a halt to the demographic collapse and a gradual reduction of imbalances. What is more, in the 21st century - in the digital, technological world - the battle in developed societies will no longer be tertiary, the location of posts that signify borders will be less important, it will not be about resources in the traditional sense of the word - oil, coal and ores, but it will be a matter of human capital. Those societies that provide quality, young, educated, and skilled human capital will be the ones to make progress. You can only generate human capital in two ways - either by creating it and holding it in the country, or by drawing it from elsewhere. In our current socio-economic reality we can hardly speak of attracting a large number of educated and skilled immigrants. Then there is only one thing left - we have to keep the young people we have today in the country. Measures should be channelled in two directions - education and quality realisation. It is no secret to anyone that Bulgarian education, both secondary and higher, is in a state of deep crisis. It is related to quantity, not quality, and also to the complete rift between the education system and the real needs of the labour market. This is exactly where the first measure needs to be, updating our education according to the realities of the modern technological, information age and even more according to the needs of business in the country. The second measure is related to quality and normally paid realisation of the young people in Bulgaria. It is clear that, with salaries of the order of 500-600 leva (on the whole this is the starting point for young people with higher education!), there is no way of keeping the quality human resources in the country. Here it is as much the responsibility of the state to improve the investment climate in the country to attract foreign capital as it is of local business that constantly complains about the acute lack of labour, but does nothing to create and retain it here.

As far as modern demographic trends in Europe are concerned, they are mostly related to the changed value system of people, the increased level of education and well-being of people, and the

increased realisation and commitment of women in socio-economic life. All this, coupled with the ever-accelerating pace of life, determines the low reproductive attitudes of the people, the two-child, and even only-child, model of families, and the dramatic aging of European societies. From this point of view, the issue of the refugee crisis and immigration to the continent from Africa and Asia should also be examined carefully. Because the start of this enormous wave of immigration was also triggered by the acute need of European countries for young workers. And we should not forget the fact that in the 21st century, as a result of technology, communications, and the fall of the borders a global movement of population is to be expected. And in these processes, the societies to gain and develop progressively will be those that are the fastest and most adaptable to change. The entire history of the human race, from the evolutionary theory, shows us that those who survive and progress are not the strongest, not the smartest, not the richest, but those who adapt best to changes. Europe needs to adapt to these changes, first and foremost in its way of thinking and, as a result, through adequate policies and measures.

Among the important objectives of the present study there is also an aim of making a comprehensive demographic forecast related to populated areas for Bulgaria up to 2030 of the main demographic indicators, which will outline the picture in the near future, and on this basis propose concrete measures and policies to improve the demographic situation in the country. We are absolutely convinced that currently the demographic picture is desperate, but it is not hopeless, and it can be improved, indeed very soon.

Also, the objectives of our project are to examine and analyse successful demographic measures and policies in Europe and to look for ways to adapt and apply them in Bulgaria.

We are convinced that there are no situations that have no way out; there is only a pause between two solutions. We think the time has come to end the pause when talking about demography in Bulgaria and make the right decisions.

## 2. Introduction

The demographic situation of a territory is determined by a number of economic, political, biological and social factors and, for its own part, it affects all spheres of socio-economic life. Today, in the twenty-first century, we are living in an extremely dynamic time, a time of great changes in all aspects of human civilisation, which are happening in periods of time that are so short that there is no precedent. We also have changes in the traditional perceptions of people, in their value systems, and in their perceptions and expectations of their lives and the lives of their children.

All these changes have a direct effect on the reproductive and migratory attitudes of people. Two fundamentally opposite demographic processes are happening in the world that highlight many challenges to the future development of the world. On one hand, there is a demographic explosion, uncontrollably high birth rate and the accumulation of an excessively young population in developing countries, and on the other hand, an ever-lower birth rate and unprecedented aging of the population in the developed world. From this point of view, Europe is experiencing a demographic transition that seriously jeopardises the functioning of its economic and social systems. In addition, this demographic situation subjects the continent to extremely serious migratory pressure from Africa and Asia. This is why traditional thinking and traditional solutions no longer work. It is high time in Europe that we realised that we are witnessing demographic phenomena which require an absolutely new approach, thinking and solutions. In the quite foreseeable future, we will have European countries with an average life span of nearly 90 years. and a total fertility rate of less than 1.

Bulgaria is also part of these demographic processes of the developed world. We have a birth rate, a total fertility rate and an aging population comparable to all other European countries. Then the question arises as to why we are talking about demographic collapse and catastrophe here, and in Europe such apocalyptic terminology is not used. The fundamental difference is in the word

migration. European countries, unlike us, not only do not have emigrants from them, they even accept numerous immigrants. Therefore, in order to improve our demographic situation in the foreseeable future, we have to change our focus and our point of view, and hence our policies. Bulgaria needs adequate regional demographic policies, due to regional demographic disproportions that are quite dramatic for such a small territory. And most importantly, when talking about demography in Bulgaria, we need to talk about one main thing - keeping young people in the country through quality education, social security and re-education, with adequate remuneration for the modern world. If we manage to do this, in spite of the current difficult situation, we will soon be able to turn the negative demographic trends into a positive direction.

### 3. Dynamics and Development of the Population of Bulgaria since the Beginning of the 21st century

Some of the biggest challenges facing Bulgaria in the present and the coming decades are related to the trends in the development of demographic processes. The deepening demographic crisis and its associated unfavourable quantitative changes in demographic parameters are characterised by a very high intensity over the past three decades and are reaching the point of thresholds where permanent destabilisation can be observed in the area of natural reproduction. The population in Bulgaria has decreased throughout the period in consideration. This trend is a result of the nature of the demographic transformation, since in the early 1990s the country's population entered the fourth stage of the demographic transition on one hand, and the great outflows of emigration that were a reflection of the deep economic crisis that accompanied the transition, on the other.

At the beginning of the 20th century the birth rate of the population in Bulgaria was 9.1 ‰. In the following years, as a result of an improvement in the macroeconomic environment, decreasing unemployment, observed economic growth,

and the entry of fertile contingents born in the 1970s, when higher fertility rates were recorded in 2008-2010, it reached 10 ‰, after which again it dropped to 9.4 ‰ in 2016. The younger age structure of the urban population and the higher number of maternity contingents also determined the higher birth rate of the population. Throughout the period under consideration, the urban population has been characterised by a higher birth rate (within one or two points) compared to that in rural areas.

Another very worrying demographic trend in Bulgaria is the high mortality rate. In the early 1990s it ranged from 14.1-14.7 ‰, after which it continued to grow to 15.1 ‰ in 2016. In Bulgaria, we have municipalities where total mortality is in excess of 30 ‰, values typical of African and Asian backward states or those in a state of military conflict. A major factor that determines the increase in mortality in recent years is related to the demographic aging, or increase of the population in the upper age groups and the decrease in the young population. An additional negative impact is caused by the decline in the standard of living, unemployment, low income, access to quality health care, etc. Unlike birth rates, there are significant differences in mortality between urban and rural populations. The more accelerated aging of the population in the villages also determines the higher mortality rates in them, with the difference of eight to nine points remaining constant over the whole period under consideration, with this reaching 21.1 ‰ for the rural and 12.9 ‰ for the urban population in 2016.

The dynamics of birth rate and mortality define the long-term tendency of limiting the natural reproduction of the population in Bulgaria. In view of the observed trends in birth rate and mortality dynamics, natural growth has decreased from -5 ‰ in 2000 to -5.6 ‰ in 2016. Differences in birth rates and mortality rates between urban and rural populations also account for large differences in the natural increase, with the difference rising to 10 points in 2016.

The data show that Bulgaria has been suffering significant demographic losses for a quarter of

a century as a result of the negative natural and mechanical growth. The analysis shows that the population of Bulgaria between the two censuses 1992-2001 decreased by 558,000, and then by 2011 by another 564,000. Up to 2016, the population growth rate decreased at a lesser rate, this being the result of increasing birth rates and the limiting of emigration processes, so that it decreased by 7,127. In other words, over a period of nearly thirty years the population of Bulgaria has decreased by 16% and only since the beginning of the new millennium by 10%. The rate of population decline in cities and villages varies greatly. As a result, urban population declined by 8.6% in the period 1992-2016 (only 4.7% in the period 2001-2016) and rural population by 31.3% (only over the period 2001 - 2016 by 22.1%). As a result of the varying intensity of population change, the relative proportion of urban population increased from 67.2% in 1992 to 73.2% in 2016.

Linked to these values is also a problem with the aging of the Bulgarian population. Although we have one of the lowest average life expectancies in the EU (74.7 years), we have one of the most aging populations in Europe and the world. The reason is the resulting vertical demographic imbalance (the ratio between the active and the elderly population) as a result of the continuing constant emigration of young people from the country. This unfavourable demographic tendency is best illustrated by a simple but indicative factor, that of demographic substitution. It shows for every 100 people attaining retirement age in the respective territory for the respective year, how many people become actively employable. About ten years ago this coefficient for Bulgaria was 100 to 124, i.e. it was progressive, 100 people turning retirement age were replaced by 124 entering the active age. Today, this ratio is 100 to 62, i.e. only 62 replace those who retire. In Bulgaria we do not have an area where the substitution is at least 1 to 1, and we also have areas such as Vidin, Montana, Kyustendil, Gabrovo, etc., where the index is less than 100 to 50, i.e. the substitution is not even 2 to 1. This is a social bomb, a real threat to the economy (an acute shortage of workforce!), and also to the social systems in the country.

The other major demographic problem of Bulgaria is the serious territorial disproportions. For a country with such a small territory disproportions like this are not logical. And we have to bear in mind that in order for a system such as the state to function normally, it is necessary to have a relative balance between its constituent elements, in this case the districts and the regions. Furthermore, for the first time in our modern history, Northern Bulgaria lags behind the south, to such a great extent, socially, economically and demographically. We have a concentration of young, active population on the Sofia-Kulata and Sofia-Bourgas axes, with the deviation for Varna. In contrast to that there are vast deserted and depopulated areas in the regions of the north-west, central northern, north-eastern Bulgaria, the Balkan Mountains and Sredna Gora, Kraishite, parts of the Rhodope Mountains and the Strandzha-Sakar region.

**Conclusion 1:** The major challenges and threats to the development of modern Bulgaria come from the serious demographic crisis, which has been going on for almost 30 years now.

**Conclusion 2:** This demographic crisis most clearly reflects on the limiting of natural reproduction, as Bulgaria has, since 1991, invariably been in the trio of countries with the highest negative natural growth rate in the world, which was -5.6 ‰ in 2016.

**Conclusion 3:** Most demographic indicators in the country and coefficient values show strong negative trends, but the biggest problems are related to the very high mortality rate and constant emigration of people of working age. Today, our mortality rate exceeds 15 ‰, with us being ahead of other European countries by several points, and in our villages this figure even exceeds 20 ‰.

**Conclusion 4:** On average Bulgaria's population is shrinking annually, from negative natural and mechanical growth, by between 50,000 and 60,000, which is a medium-sized city in the country.

**Conclusion 5:** There are two distinct demographic imbalances in Bulgaria, one is vertical, in the ratio of the young to old people, which determines the dramatic aging of our population, and a horizontal

one, related to whereabouts of residence on the territory of the country.

#### 4. Contemporary demographic trends, and reproductive and migratory attitudes in Europe

One of the serious problems when talking about the demographic situation in Bulgaria is the consideration of this being for its own sake, and detached from the demographic processes and changes in the developed world to which we belong. From this point of view, we are focusing on indicators and trends that we can scarcely influence, and which are definitely not Bulgaria's problem.

In our country we constantly talk about the critically low birth rate, the constant records of the fewest babies born since censuses began, and the aging of the population. All three things are clichés that divert our attention from the real demographic problems. As regards the birth rate, it is low, but it is low throughout Europe. There is no European country where the total fertility rate is above 2. And we well know that developing a demographic society a total fertility rate should exceed 2.2 to eliminate the effect of infant mortality, which is calculated on the basis of those born, but deceased before the age of one. Thus, Bulgaria with its total fertility rate of 1.4 fully fits into the common European demographic picture.

Yes, in the last few years (2015, 2016, 2017), fewer and fewer infants are born each year, and negative records are being broken each year in this direction. But this is also a normal process. Neither is it happening sensationally, nor do we have a sharp change in reproductive attitudes, now that those born in the 1990s, when Bulgaria was already in a demographic crisis, are of childbearing age. That is to say, the child-bearing contingent is constantly shrinking, and when we add to this to the continuing emigration of people of working age, this birth rate reduction is attained in absolute terms. And that is how it will be in the next few years.

In addition, the problem of the aging of the Bulgarian population is exaggerated and misrepresented. We

have one of the lowest average life expectancies in the EU (74.7), but we are one of the world's most aging nations. And we are the only nation in the world, in all human history, where for one of the two sexes (in this case female) the largest cohort of the population is already of retirement age (60-64), but this is only because of the continuing intense emigration of young people from the country. That means that Bulgaria's major demographic problem is not the birth rate and the decrease of our population in absolute terms, but the emigration of young people, and hence the demographic imbalance in the relation between the active and the elderly population and the extremely high mortality rate for a European country, due to other additional factors. Overall, however, Bulgaria fits quite normally into the current demographic trends of the developed world.

And what are these trends? Few people are aware of the drastic demographic change in the world since the industrial era. Throughout the whole of human history, the earth's population has either increased extremely slowly or even decreased. The factors were of course mostly very high general and infant mortality, caused by lack of medicine, poor health and low culture of hygiene of people, major disease pandemics, wars and regional and global climate change, as a result of which whole cultures died, such as the Mayans and the Aztecs. In the first century AD, the entire population of the earth would have fitted into one single state, and this is the largest Muslim country - Indonesia - just 250 million people. At the beginning of the second millennium, the entire population of the earth would once again fit into a single modern country - the United States - just over 300 million, but this area of the United States means a sparse population density and no food or resource problems.

And since the beginning of the Industrial Age, the beginning of the nineteenth century, there has been a dramatic change in the way people think and live, which also determines the current demographic situation in the developed world, and in particular in Europe! In less than 200 years, the population of the world has grown from 1 billion. (1820) to 7 billion (2011). And by the end of the 21<sup>st</sup> century it is expected to exceed 10 billion.

What is the change? First of all, with the Industrial Revolution, the medical service had an influence on life and ordinary people. This led to a rapid drop in overall and even more to child mortality. Second, education, which had been a privilege for few people throughout human history, became widely available, controlled by the state, and became the norm in people's standard of living. This led to an accelerated reduction in reproductive attitudes and to the reciprocal increase of parental demands and wishes for the future of their children, which also negatively affected the attitude towards having more children in the family. Thirdly there is emancipation and gender equality. If, in all human history, the woman has had a subordinate position in the family as a result of biological and religious prejudices, and her role was limited to that of a mother and wife, who supported her home and family, today women are looking for their historical revenge. This is expressed in the desire and need for quality education, quality realisation, and acknowledgement and respect of their dignity and rights. As much as this sounds democratic and politically correct, it also has a negative impact on reproductive attitudes, as no one can substitute a woman in a purely biological sense and in the function of being a mother. All this is combined with the ever-accelerating dynamics of life and rapid changes in technology that mean a modern person faces many challenges and difficulties that people did not encounter in any previous era and which also reduce one's desire for family and more children. Here we are talking about career development, which is accompanied by fierce competition, the need for continuous improvement and the accumulation of new knowledge, distancing and alienation in modern urbanised societies, endless opportunities for entertainment and leisure, and last but not least the cruel stress caused by these factors that lead to many diseases, among which one of the most terrible is sterility in people of working age. Only in Bulgaria this amounts to 150,000 family couples who are of an active age and want to have children, but cannot because of purely physical problems. There are millions in Europe; it is no coincidence that, for ten years now, the sterility in Europe of people of working age has been defined as a pandemic.

All this has led to a change not only in the way of thinking and life of modern people, but it also completely reverses our perceptions of normal

demographic development and a normal demographic situation, as well as normal values of demographic indicators.

One of the major changes is the unprecedented aging of the European population. What does this total conversion of our perceptions of normality into demographic indicators mean? If, until half a century ago young people were seen as being up to the age of 25 and a little later to 29, today, due to the drastic increase in the average life expectancy and the aging of the population, this limit has gone up to 35-40 years. And this is normal if we only look at the change in average life expectancy in the last little more than a century. At the beginning of the 20<sup>th</sup> century the average life expectancy in Europe varied between 40 and 45 years, with Spain as one of the most aging European nations, with an average expectancy of 34.3 years. Today, we assume a normal life expectancy in Europe to be more than 80 years, and Spain, which we have just mentioned, is the fourth-highest in the world with 82.8 years, i.e. in just over a century, the average life expectancy in the continent has increased twofold, or two and a half times and continues to grow. According to demographic forecasts, by the middle of the century, Italy, Spain and Switzerland could reach an average life expectancy of 90 years!

The unprecedented accumulation of an elderly population is already a fact in Europe. Only within the last hundred years the number of people in the world aged 65 and over has grown from nearly 5 million to about 50 million, and the number of those aged 85 years and over has grown from under a million to more than 7 million, and everything this is mostly due to Europe. This means that at European level on this issue we have to seriously change our way of thinking in several directions: increasing the active life, including labour, of so-called elderly people; orientation towards a "silver" economy, activities, communications and services aimed at the elderly; and the inevitable, albeit undesirable, increase in the retirement age if we want to keep the current level of pensions; as well as the necessary "replenishment" of young people to address the vertical demographic imbalance. The issue of immigration in Europe is very painful, but it is part of these processes and we will discuss it in detail at the end of the analysis.

If population aging is a demographic phenomenon that we associate with something positive, namely the increase in average life expectancy, we talk about the second demographic phenomenon - the critically low birth rate - with great alarm. But it is exactly related to this that we have a mistaken way of thinking, we undertake erroneous policies, and we get negative results.

In all epochs and public structures of the earth, there has been an extremely high birth rate and a model of families involving numerous offspring. Now, for the first time, we are faced with a sustainable two-child and even one-child family model. Not to mention one of the demographic phenomena of the modern age, "the voluntary abandonment of a generation", in which more and more people postpone the birth of a child, due to a number of circumstances, to a point where they can no longer physically have one because of the above-mentioned reproductive problems in an active age. And since we have had this family model for about 30 years, in which time three generations have gone by, we are getting ever more reduced reproduction and an ever-declining contingent of childbearing population. And this will be reproduced and deepened in the foreseeable future. These reproductive attitudes are determined by the higher level of education in Europe, with the inversely-proportional link between education and birth rates, especially the increased level of education for women, by the emancipation and active participation of women in all spheres of socio-economic life, by increased demands of parents regarding the future of their children, and by the spiral of material acquisitions that determine the consumer-materialist value system of people in the developed world.

The third point that we would like to present, speaking about the demographic situation in modern Europe, is the painfully familiar problem of immigration from Africa and Asia. And if, for the previous two, I said that we have misconceptions and a misguided focus, about immigration we can safely say that we are talking only in worn out clichés, and we are not even trying to get to the crux of the problem, and that is where the constant panic and anxiety comes from in Europe whenever the words "refugees", "immigration" and "Muslims" crop up in conversation.

About immigration, we speak only from the bell tower of 2016, 2017, 2018, and from the Eurocentric point of view, without realising that all modern social and political processes are the result of causal relations of history. This is also the case with the current pressure of immigration on Europe.

The genesis of the refugee wave is in the history and specificity of the colonial period. For several centuries, after the Age of Discovery, and especially the technological revolutions in Europe, it managed to go beyond its physical boundaries and, thanks to ocean-going ships and firearms, to conquer the Americas, all of Africa, Australia, the islands of Oceania, and vast territories of Asia. The colonial period we love to call the "civilisation" of the newly-conquered lands was expressed in genocide against the local population, the destruction of original and ancient cultures and the ruthless plunder of their natural and demographic resources. As a result of all this, the development of the respective territories has been held for centuries. And while both the Americas and Australia are fully resettled with European populations and follow a European model of economic, political, social and demographic development, Africa and Asia are now going through the stages of development that Europe underwent in the 19th century.

The most important factor underlying the current refugee crisis is the demographic explosion. All the territories of the world go through this stage of demographic development, but Africa and Asia are experiencing it today. As a result, they have an extremely high birth rate, of the order of 40-50 ‰ and a natural increase of between 20 and 30 ‰. These values lead to the accumulation of overwhelmingly young populations in areas with non-working economies, with extremely high youth unemployment, with illiteracy levels of more than 70-80%, with dictatorial, corrupt regimes, terrorising their own population, and numerous ongoing military conflicts. Only in Africa there are currently more than 100 such conflicts. Another factor is climate change and the increasingly severe shortage of quality drinking water. All this creates intolerable living conditions and is the most important catalyst affecting the migration flow to Europe.

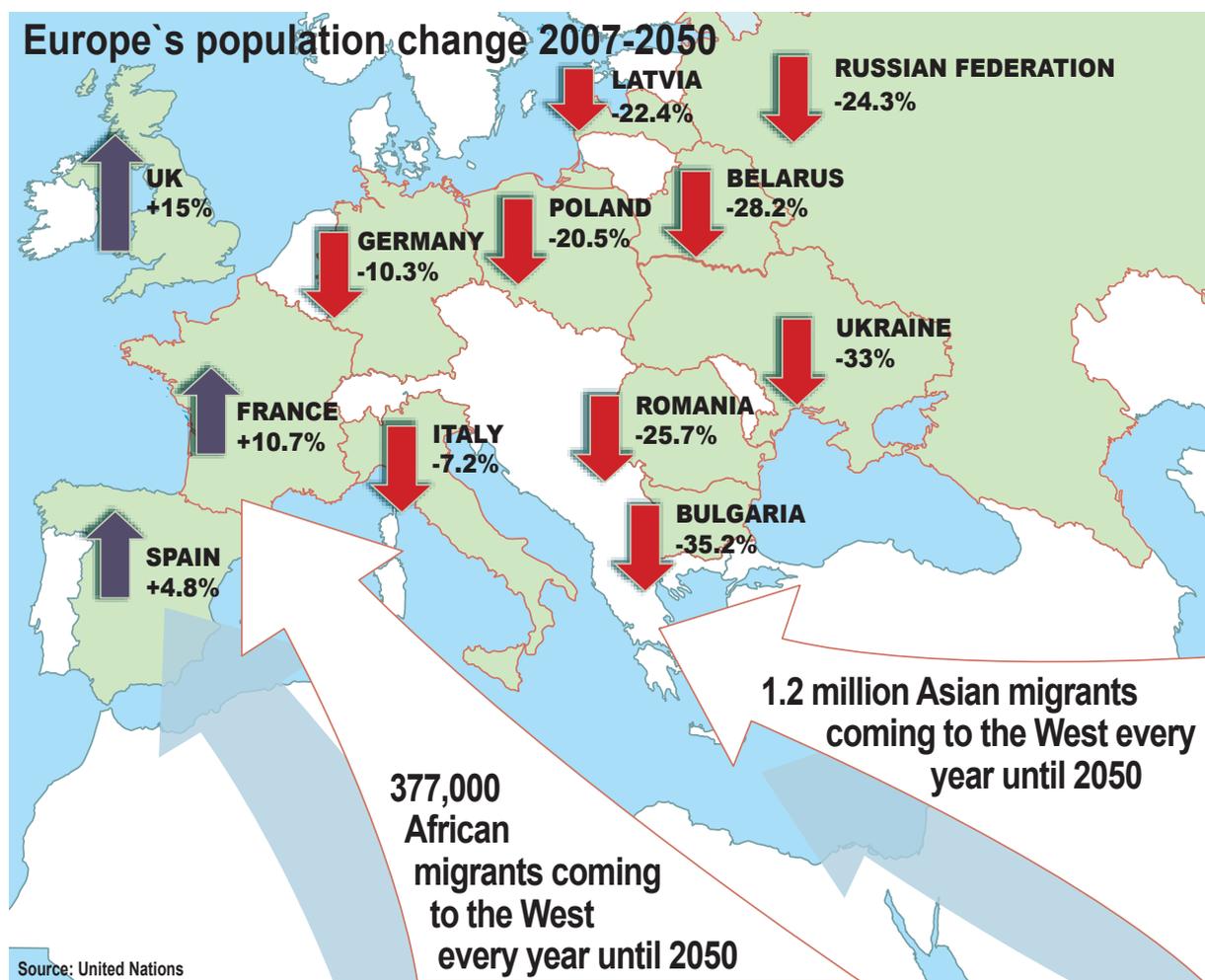
Here, however, we must point out straight away that Europe itself needed this immigration, although of

course not on the scale on which it is happening today, because of its drastically aging population. This is why we really need to stop with the clichés and the one-sided view of immigration, so that we can properly respond to it in Europe.

Here the big question is not what kind of decisions Europe should take to curb the wave of refugees, but why it came to be that Europe was unprepared, since there were indications of this at the very beginning of the 21st century. All the

processes in Africa and Asia that produced it were known and visible, and it was easy to predict such massive migratory pressure on the old continent. And it was predicted, as early as 2007. The UN published a map of the expected growth of the European population up to the middle of the 21st century as well as the expected migration pressure. At that time 1.5 million immigrants annually from Asia and Africa to Europe were predicted for every year between 2007 and 2060. And this forecast is now coming true.

Fig.1 Europe's population change (2007-2060) and the projected immigration pressures from Africa and Asia



And we must also note that this is not the peak of the migration wave; Europe is now hit mainly by Asian immigration, with the great African immigration wave yet to come to the continent, adding the so-called "climate migrants" fleeing from ter-

ritories in Africa that, due to climate change and acute shortages of drinking water, have impossible living conditions. The IPCC (Intergovernmental Expert Group on Climate Change) forecasts between 50 and 200 million climate migrants from

Africa by the middle of the 21st century, and they will mainly target Europe.

Therefore, Europe needs to adapt to these new conditions, both inside the continent and in the surrounding areas, in order to take adequate measures to deal with the great migratory pressure on it. Nor should we forget that, as a result of the development of technologies, means of communication and means of transport in the 21st century, we are expecting a global movement of population, and this will inevitably be directed from low-developed economies, and the young people accumulated there, towards those with a high standard of living, education and opportunities for realisation.

The factors and peculiarities mentioned here place Europe in completely new demographic and social patterns of behaviour of the population. And we need to analyse them very carefully in order to obtain a real idea of what is in store for Europe for in the near future and how Europe should react adequately.

Demographic patterns of people's behaviour are a mixture of multiple factors, but we start from the hypothesis that people essentially have the same needs, desires and fears, and therefore the specific situation and conditions in which their reproductive behaviour is formed. From this point of view, modern Europeans have not lost basic values, such as family and children, but the conditions in which they live are reducing their reproductive desires. First and foremost, they are brought into a highly competitive environment, which requires them to put in more and more effort and energy in order to be competitive and successful. This means it is a mass phenomenon for young people aged 28-30 to live with the clear feeling that they have already missed out on making a career, and that they have been drastically left behind by their peers because they have not achieved the expected career development and material benefits of their friends, their competitors, or their role models. That is why the phrase "burnout" is so popular today - a literal burning out due to tension and stress. This leads to a lot of confusion and chaos in people of an active age, as they have to meet the ever-increasing demands of time, environment, parents

and friends. And they automatically pass on these requirements to their children, thus meaning that the circle becomes closed and the behaviour is compounded. Undoubtedly, modern man has the kind of opportunities for life and realisation that no human being from all the stages of development of homo sapiens has had before, but at the same time this constantly makes him confused about what to choose, which path to follow and, if this choice is wrong, whether it might not be fatal because he will lose touch so drastically with the others. Fear of mistakes makes people passive, indecisive, and inclined to isolation and closure in the artificial world of social networks, online identities and online communication. This is communication where nobody sees you and you can make out that you are what you want to be, thus ridding yourself of your fears that inevitably come to light in normal communication and socialising.

All this is combined with the practically unlimited possibilities for entertainment and travel that modern people have in the developed world. Here comes the other fear - of missing out on something, which also reduces reproductive attitudes.

Given also that technology will continue to develop ever faster, and that we will live more and more in virtual reality, and that in thirty years or so more than 50% of the professions we have nowadays will not exist at all, we must take on board the realisation that we will also have quite different models of demographic behaviour compared to those that we are used to.

In short, in the foreseeable future, by the end of the 21st century, we should expect a sustainable two-child and one-child model for European families, a continuous increase in average life expectancy (it will reach and exceed 90 years!), an aging population, an increased percentage of mixed marriages and the continued shifting of global population, which will affect Europe most of all. Europe will appropate a new kind of multicultural society in which traditional identities and perceptions of the world, and their cultural and historical conditioning will be of less and less importance compared with where one lives and realises the current environment in which one is living. We need to bear

in mind, also through this 21<sup>st</sup> century that we are living in, that Africa and Asia will go through the same stages of demographic development that the developed world has undergone, i.e. a gradual rise in their level of education is also expected, along with the reduction of fertility, and stagnation of their demographic behaviour.

All this means that we should not be frightened by the demographic processes that are happening in Europe and the world, but we should adapt to the changes with our eyes set on the future and strive to preserve our European Christian identity not in the way in which we have known it for the last two thousand years (this is impossible!), but according to the new living conditions in the digital, global world.

**Conclusion 1:** The population of Europe is rapidly aging and will continue to do so along with the increase its average life expectancy (already around 85 years!) due to objective factors of high living standards and increased quality of medical services and education.

**Conclusion 2:** The birth rate in Europe is critically low (with a total fertility rate of about 1.5!) And will be ever lower in the decades to come, and we Europeans have to adapt to this demographic phenomenon and the consequences it brings!

**Conclusion 3:** The pressure of migration on Europe is the result just as much of the drastic aging of Europe's population as it is of the need for a young labour force, and of the late development of Africa and Asia due to the colonial age. This development is reflected in the demographic explosion and the accumulation of an overwhelmingly young population, who live in territories of poor economies, huge youth unemployment, cruel dictatorial regimes, constant military conflicts and an acute shortage of drinking water, which makes their emigration to Europe a question of their very survival.

**Conclusion 4:** The world and Europe are changing very rapidly under the influence of technology and the means of information and communication. This puts a modern European person under very serious pressure from internal and external

sources, which inevitably changes his demographic patterns of behaviour. In the 21<sup>st</sup> century we will have new demographic patterns that we should not be afraid of, but we do need to see how to preserve and reproduce our European Christian identity through all this in the realities of a completely new world.

## 5. Demographic Measures and Policies in Europe

When we talk about demographic policies in Bulgaria, we are confronted with two things: on one hand, a lack of understanding of what demographic policy is all about and, on the other, exactly what measures we need. In this part of the analysis we have tried to analyse the essence of demographic policy as a socio-economic phenomenon, most of all what demographic measures are applied in Europe and how they can be adapted to Bulgarian reality and contribute to the optimisation of the demographic situation here.

Broadly speaking demographic policy is a series of measures (some of which are legislative) taken by an executive (state or local) authority to stimulate or limit the birth rate. In this context, we have two types of demographic policy: pro-natalist (birth-stimulating) and anti-natalist (limiting the birth rate). It is clear which societies need an anti-anticultural policy. For now, the most successful one is in China with a model of the Chinese family with one child. With a different amount of success or failure, anti-natalist policy has been conducted by India, Iran, Indonesia, and some African regions.

For now, a pro-natalist policy is a full priority of the developed world, and particularly of Europe. For the first time a purposeful demographic policy in Europe was discussed in the late 1930s. Shortly before the Second World War, France anticipated the change in reproductive behaviour and demographic patterns and introduced the so-called "*Code de la famille*". The Second World War put an end to everything normal on the continent, and then the painful recovery of Europe began with the first baby boom of the century,

which was compensatory because of the very low birth rate in the years of the war. In the aforementioned France the birth rate in 1948 increased by 37% compared to 1937. And, although twenty years later Europe experienced a new baby boom related to the hippie generation, teen culture, and the propaganda of "free love," the continent stubbornly embarked upon the path of demographic crisis, low birth rates and aging. Again in France, the idea of a purposeful pro-natalist demographic policy came about to maintain the demographic balance in the country. This was expressed in the granting of low-interest and interest-free loans, with long-term repayment for families with three or more children to purchase housing. In addition, low-interest and interest-free loans were granted, with a long repayment period for families with numerous children for the development of small and medium-sized businesses, especially in agriculture, tourism and the food industry. Here, the desired effect was double, boosting the birth rate and keeping young people in the province, by supposedly transferring the family business from fathers to children. Politics yielded its results: from all Western countries France maintains the largest relative demographic and territorial balance, and today the rural population is about 20 percent of the total.

At the same time, the second half of the 20th century and the countries of the Eastern Bloc, including Bulgaria, pre-empted such a policy oriented towards young families, with free children's kitchens, free kindergartens and education, and assistance in buying a home.

Since the beginning of the 21<sup>st</sup> century, again in Western Europe – in countries such as Belgium, non-standard social and demographic measures were undertaken. There they had already reached the conclusion that it is very difficult, with financial means, to encourage a financially secure and independent person to have more children, and the big problem is not money but time - time and the fear for the development of one's career and the loss of one's job, and hence of status in society. In these countries, they applied the "time credit" measure, which gives one-year's paid leave (to have more time for one's children or to look after a

sick person or an elderly relative) or longer if one was working part-time, whilst guaranteeing the workplace of the person. If it was in the private sector, the employer was compensated whilst they kept this place. These measures yielded results, but before they, along with other such measures, were taken, Western Europe suffered the onslaught of the refugee crisis and faced entirely different problems.

At present active policies aimed at youth and birth rates are applied in countries in northern, central and eastern Europe, and we must point out that central and eastern European countries have, without exception, been affected by serious demographic crises in their transition from socialism to democracy.

No specific independent demographic policies have been implemented in Northern Europe, but rather a number of social measures related to maternity, unemployment benefit, financial aid for single parents, a tolerant model of kindergartens in conditions similar to those at home, and quality education, which create the necessary conditions for people to have children and look after them. And this has produced very positive results, since from the beginning of the 21<sup>st</sup> century, for the first time since demographic observations began, Northern Europe is characterised by higher child-birth rates and more stable demographic indicators than Southern Europe.

For a more specific example we can look at Russia and Hungary, where under Putin and Orbán governments have undertaken intensive mass pro-natalist policies. In Russia, they give about 10,000 euros (or the equivalent in rubles, of course!) for every second and subsequent child in the family.

The government of Viktor Orbán in Hungary went even further, by giving about 33,000 euros free of charge to a family with a minimum of secondary education for both parents, provided that they had three children in 10 years. Although the funds allocated to these two policies are unprecedented and have produced positive results, they have not completely resolved the problems of the

two countries. Yes, Russia fell from -5 ‰ to -2 ‰ natural growth, and Hungary from -5 ‰ to -3 ‰, but they still have negative values. This once again confirms that in the developed societies of the modern world, only financial support for birth rates cannot solve a demographic crisis, and a number of other measures are necessary to keep young people in their home country for them to create families and have children.

If we have to sum up, in modern European societies, a mix of demographic, social and economic measures is being implemented with the aim of stimulating birth rates and reducing the negative effects of aging populations and altered demographic patterns. These measures include the following:

- One-off financial incentives for second and each subsequent birth
- Financial incentives for large families, with the introduction of an additional condition for a minimum educational threshold for parents
- Tax benefits for parents with more children
- Income family tax, progressing with the increasing number of children in the family
- Financial incentives and care for single parents
- Time credit to facilitate child raising in the situation with acute shortage of time in the modern competitive world
- The provision of more opportunities for *in vitro* procedures
- A complex of social measures, including unemployment benefits, conditions in kindergartens and an educational system that meets the requirements of modern conditions

**Conclusion 1:** Demographic policy is a series of measures (including legislative ones) that an executive authority (central or local) undertakes with the aim of stimulating or restricting the birth rate.

**Conclusion 2:** In view of the lower birth rate in Europe and the aging of the population since the end of the 20<sup>th</sup> and the beginning of the 21<sup>st</sup> century, targeted demographic policies as well as social ones are being implemented with associated economic and demographic measures.

**Conclusion 3:** The main demographic policies and measures are related to financial and tax incentives for large families, more and more often with the introduction of an additional minimum parental threshold of education. A number of social measures are also implemented, whose aim is to alleviate the lives of parents in the modern, dynamic and over-competitive world when they are looking after their children.

**Conclusion 4:** There is a growing awareness that the widely used financial measures to boost birth rates cannot have a significant impact on societies with high levels of welfare and financial prosperity; rather, measures should be sought to help young people in combining career development with their natural desire to create families and raise more children.

## 6. Demographic Trends and Processes in Bulgaria and Demographic Forecast up to 2030. Territorial peculiarities.

In recent decades, human capital has taken on ever-increasing importance. It is seen as a leading factor in modern development, bearing in mind that demographic development is closely related to economic development. Human capital, together with its quantitative and qualitative characteristics, can hinder or accelerate the development of a given territory. These tendencies acquire another interpretation when viewed in a spatial aspect, bearing in mind the specificities of a given territory. This section discusses the influence of factors that are different in character. On the basis of the analysis of the present condition, the trends in the demographic development, as well as the expected impact of factors that are different in nature, we present a time-bound (by 2030) and area-based (by place of residence) forecast of the population in Bulgaria.

## 6.1 Methodology

In order to make adequately accurate forecasts about population dynamics in a given territory, it is necessary to define and measure demographic factors affecting population change. In the literature and adopted methods of population prediction, the main indicators that influence population change are the following: the population of a given territory during the current period, the expected mortality rate, the birth rate and the natural growth rate, and the level of migration flows for the same period.

In the demographic prognosis of the Bulgarian population, the method of projecting aging (or the cohort component population projection method) of the population is used. It has a conceptual advantage because it groups the population by age cohorts (age groups at five-year intervals) and the characteristics (coefficients) of the main factors for each group are calculated individually. Population decomposition by age enables us to evaluate the future demographic potential of the workforce and the reproductive capacity of the population. These advantages determine it to be the most appropriate choice regarding the method of prediction, rather than other methods (extrapolation method, symptomatic analysis, regression analysis, etc.).

The technique of population prognosis using the cohort component method for each surveyed period undergoes the following stages:

### 1) Identification of key elements:

- Number of population broken down by age group at five-year intervals;
- **Assessment of the level of survival of different age groups for a past (known) period.** This coefficient is the opposite of the mortality rate and represents the likelihood that people in a group (e.g. 0 to 4 years old) will survive to the next age group, taking into account changes in natural population growth / decrease;
- **Calculation of the number of women of child-bearing age;**

- **Determination of fertility rates.** This step aims to determine for the projected period the number of persons in the first age group (0 to 4 years). The coefficient is calculated as the ratio of the number of new-born children to the number of women in the fertile age per 1000 individuals.

2) Projecting the number of the population for all age groups except for the first group.

3) Calculation of the number of births in the first age group of 0-4 years based on the fertility rate and the number of women of childbearing age.

4) Correction of the number of those born in the 0-4 age group with the corresponding probability of survival.

5) Final total projection of the total number and age groups of the population in Bulgaria also by place of residence based on the results of points 2, 3 and 4.

The output data used were taken based on the age structure of the population by place of residence in 2015 and the last two censuses in 2001 and 2011, as well as data from current demographic statistics on natural (birth rate, mortality, natural growth) and the mechanical (settled, displaced, mechanical growth) movement and trends in the way they have changed over the past 15 years. In the development of the demographic forecast, overall birth rates, mortality rates and natural growth, as well as the number of women of child-bearing age and respectively the age-based fertility rate are incorporated. In the different variants of the prognosis different possibilities for birth-rate and fertility are used. The probability of dying, and the probability of survival to the following year are taken from the mortality tables developed by the National Statistical Institute.

The demographic forecast is given in three variants for the time-bound (2020-2030) and area-based (population) forecast of the population (number, age structure), taking into account the degree of influence of factors with a stimulative and a restrictive effect. Elaborating the forecast in three variants guarantees greater flexibility and

anticipation of the factors that could affect the future demographic development.

When developing the different variants of the demographic forecast, one takes account both of the trends of the demographic development up to the present moment and of the expected impact of factors that are different in nature. The differences in the numerical values of the different variants of demographic forecast are also viewed in this sense, namely:

- **Variant I (tendential, realistic)** – which incorporates the preserving of the tendencies of the demographic, socio-economic and infrastructure development of the settlements hitherto.
- **Variant II (optimistic)** - which it is supposed that demographic development will take place under favourable socio-economic conditions and an improvement of the demographic processes.
- **Variant III (pessimistic)** - in this variant the development of the population is predicted according to hypotheses about unfavourable socio-economic processes in the country and aggravation of the demographic processes.

The different demographic variants are based on projections for the expected future development of natural and mechanical population growth. They are hypothetical in character, taking into account the current dynamics regarding birth rate, mortality rate, the number of women of childbearing age, the fertility rate, settlements and displacements. Each locality is distinguished by its specific features in the demographic development, which is the result of the peculiarities in the ethnic-religious structure, and development which is social, economic, infrastructural, etc. The differentiated approach is applied in determining the parameters of the demographic forecast for the number of population by place of residence. For each one of the settlements in Bulgaria, individual values for the fertility rate and the mechanical growth rate are determined (taking into account the current values and the trends in these processes in the realistic version, deterioration of the demographic indicators in the pessimistic variant, and improvement

of the demographic situation in the optimistic version). The probability of dying and the likelihood of survival to the following year are taken from the mortality developed tables by the National Statistical Institute. Average life expectancy is preserved for all three variants of the forecast at 74.7 years (with this being 71.1 for men and 78.28 for women). After calculating the number, gender and age structure of the population for each settlement, the results are summed up and the total number of the population in Bulgaria is calculated. It is exactly this way of calculating the total number of the population in the country also by age groups that distinguishes it from the population forecast prepared by NSI. We believe that, with the application of the methodology described above, we have obtained more precise and correct results.

## 6.2 Demographic Forecast of the Population of Bulgaria. Territorial Features.

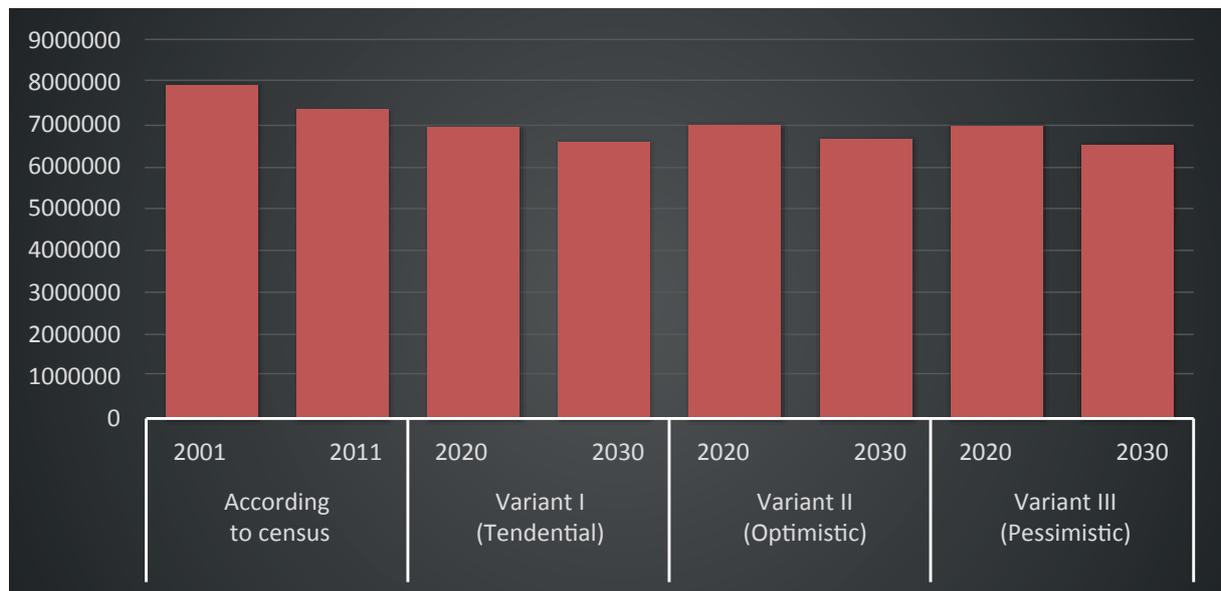
Demographic forecasts are typically steeped in a number of conventions, although they reflect processes that are straightforward, sustainable and long-term. There are different reasons for these conditions. Some of them have a demographic nature and are derived from the stochastic character of demographic processes, which predetermines the future development within certain limits and specific figures. Others are of a nature which may be more economic, psychological, cultural, ethnic, religious, etc. When determining the estimated forecast of the population, the impact of two major groups of factors, which can be conditionally identified as stimulative and restrictive demographic developments, has been taken into account. The first group of factors includes increasing investment activity and revitalisation of the economy, improvement in the infrastructure, the enhancing of regional functions, improving facilities, increasing tourism potential, and so on. The second group of factors includes a deepening of the economic crisis, reduction in investment activity, increase in socially significant diseases, increase in emigration mobility, deterioration of the environment, deterioration of the living standard, increase in unemployment, and negative changes in the psychological attitude towards raising children - bearing in mind that the

reproduction of the population is in its essence an economic and socially conditioned process - as well as other factors.

By applying the estimated values of the indicated demographic indicators and taking into account the degree of influence of the two groups of factors, the demographic forecast for the total number of the population is determined (Fig. 2) In all three

scenarios, the population is projected to decrease (in 2020: 6,966,000, 7,006,000 and 6,493,000, respectively, and in 2030 6,554,000, 6,677,000 and 6,493,000, respectively), but at different rates - between 11.6 and 12.4% for the period 2001-2020. If we view the last year of the forecast period - 2030 - compared to the beginning of the 21st century, the percentage decrease of the population is expected to be between 15.8% and 18.1% (Fig. 2).

Fig.2. Population of Bulgaria (2011-2030)

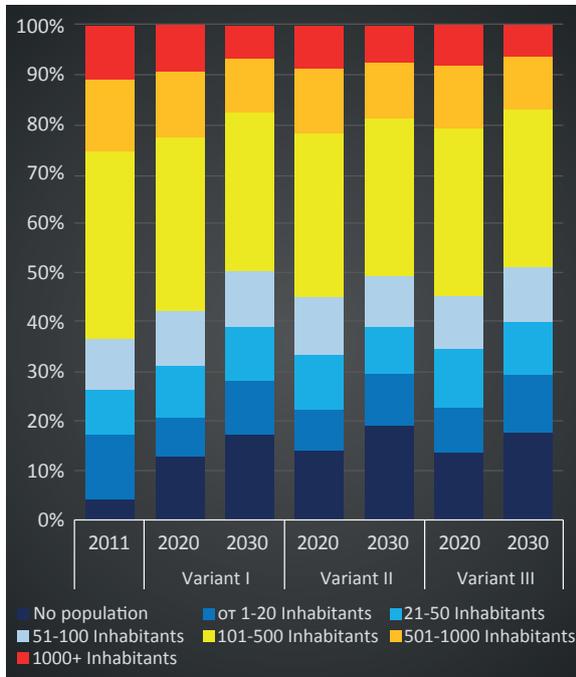


In the second half of the 20<sup>th</sup> century and the first decade of the 21<sup>st</sup> century, migration has had a significant impact on the development of the settlement network and led to an exacerbation of regional disproportions in the territorial distribution of the population. The migration processes observed lead to an even greater increase in polarisation in the demographic sphere, which is reflected in an increase in population concentration in large cities on one hand, and an increase in depopulated territories on the other. In 2001 and 2011, 69% and 72.7% of the population of the country respectively were concentrated in cities. Over the coming decades this concentration will increase insignificantly to 75.6% in 2030 in all three forecasts. In the last census, 68% of urban settlements were very small (up to 3,000)

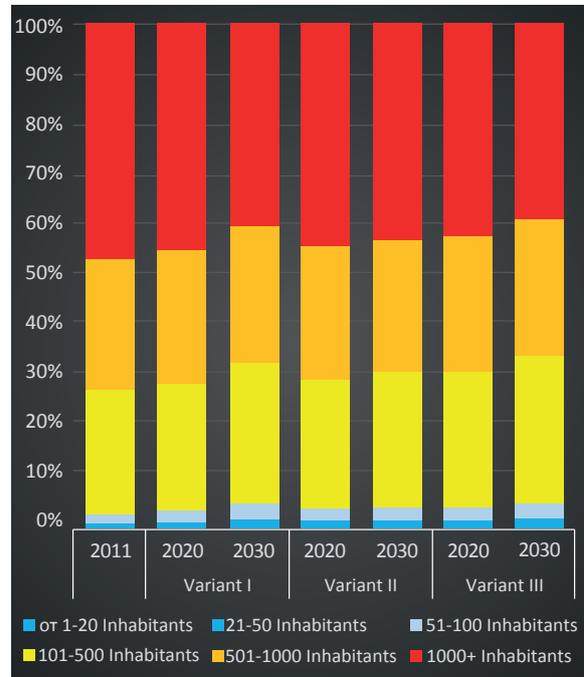
and small towns (3,001 to 10,000), but these accounted for only 13.8% of the urban population. By 2030 the proportion of this number of urban settlements will grow to 76.1%. In 2011, besides the capital, six more cities had a population of over 100,000. (Plovdiv, Varna, Bourgas, Ruse, Stara Zagora and Pleven), with 46.2% of the urban population and 33.6% of the population in the country living in them. By 2030 of the above-mentioned cities only Sofia, Plovdiv, Varna, Burgas, Rousse and Stara Zagora will fall into this group of settlements, with more than half of the urban population and 42% of the population in the country. The latter bears testimony to the continued polarising nature of demographic development, which will create serious difficulties in the future spatial planning and development of the country.

Fig. 3. Distribution of settlements (a) and population (b) depending on the number of population in villages in Bulgaria (2011 -2030)

a).



b).



The development and character of the settlement network plays a significant role in the overall social and economic development of the individual territories, especially in the construction of a cost-effective transport network and access of the population to different kinds of services. The deepening depopulation processes are changing the scope, structure and stability of the network of settlements in Bulgaria. In the structure of rural settlements in 2011, the non-populated settlements made up 4.4%, and those with up to 20 inhabitants accounted for 12.8%. In the coming decades, one of the worrying trends that has been observed is the significant increase in the number of depopulated settlements, which, according to the different forecasts will range between 880 and 977 settlements, and their share in the settlement structure will reach close to ¼ (between 17.3 and 19.2%) in 2030. If settlements with a minimal population - up to 20 people - are added to this group, the proportion will reach nearly 30%. Settlements with between 100 and 500 inhabitants make up the largest proportion in the settlement structure of the country, as they

accounted for 14.7% during the last census and this share is expected to decrease by 2-3 points by the end of the period under review. Another alarming trend that is observed is the decrease in the number of villages with more than 1000 inhabitants. Their share will decrease by almost half from 10.9% in 2011 to 6.4% in 2030 (Fig. 3a).

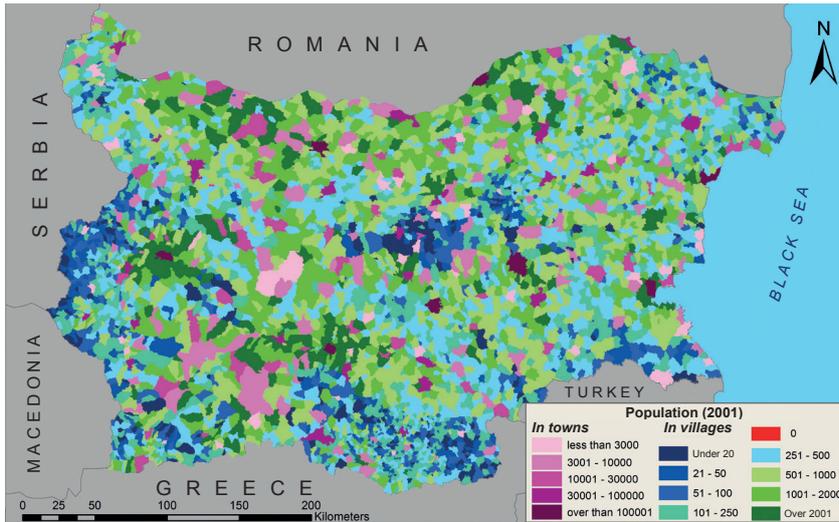
The distribution of the population in the different categories of settlements, depending on the number of their population, differs significantly from the urban structure that we have outlined. In 2011, nearly half of the rural population (46.6%) was concentrated in the largest villages (over 1000 inhabitants). By 2030, as a result of the decrease in the population and the villages moving into the category of settlements with a smaller number of inhabitants, this proportion will decrease according to the different variants of the forecast by 4 to 8 points. In the other categories no significant changes in the proportional distribution of the rural population in the different categories of settlements are observed. In 2011, half of the population is concentrated in large villages and those of average size (25.9% in those

with 501 to 1000 inhabitants and 24.5% in those with 101 to 500 people.) By 2030 no significant changes are expected, with proportions reaching between 26.4 - 27% and 26.6 - 29.5%, respectively.

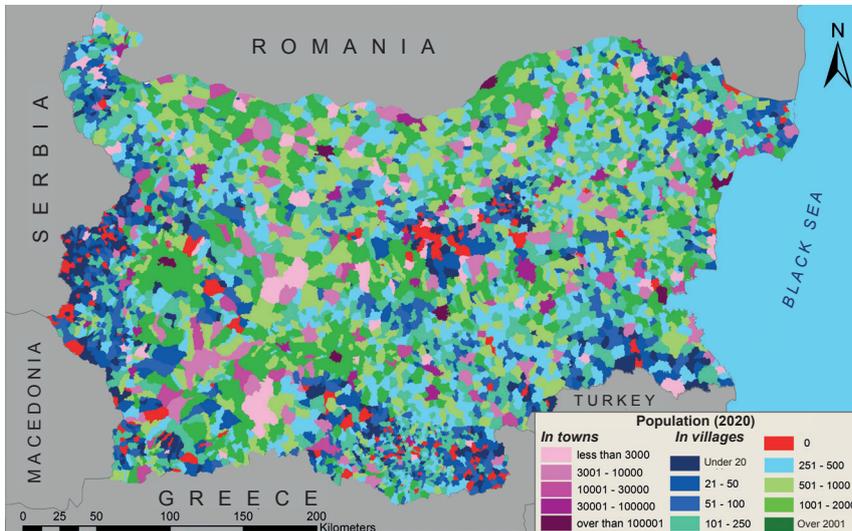
An insignificant proportion of the rural population is concentrated in small and very small villages (less than 50 inhabitants) - below 2% throughout the projected period in consideration (Fig. 3a).

Fig.4. Population by number of inhabitants in settlement (a) in 2011; (b) in 2020; (c) in 2030

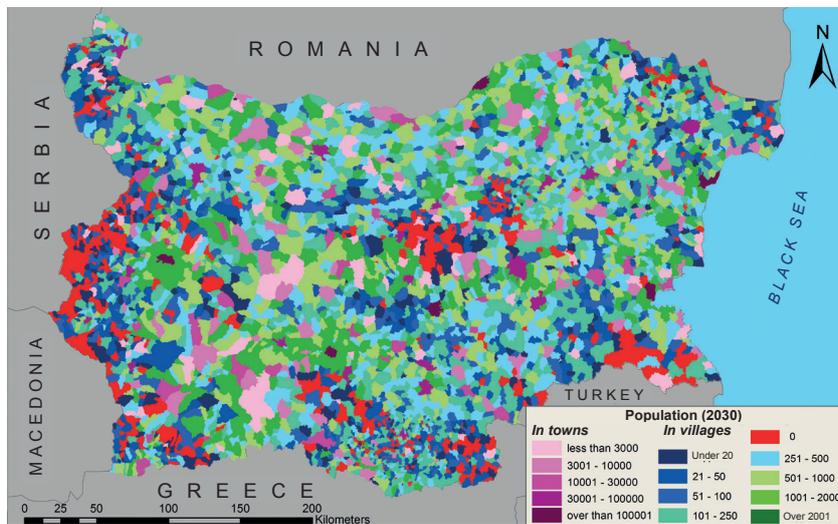
a)



b)



c)



The small and very small villages are located mainly in the mountainous and border regions of Kraishte, the Osogovo-Belasitsa Mountain Range, the Central Balkan mountains and their northern foothills (Predbalkan), the Eastern Rhodopes, Sakar-Strandzha, and the western foothills of the Rila and Pirin ranges. In the years to come there will be an expansion of the territorial range of this group of settlements around the outlined areas, and by 2030 a significant number of them will be completely depopulated. The low level of urbanisation of these territories is an indicator of the nature of their economy and of the importance of agriculture in the structure of this economy. The nature of the settlement structure, the predominance of small villages, and the dispersed nature of the settlement network are indicative of the fact that a large part of the population has no direct access to a number of services, which will accelerate the processes of depopulation in the future. The large villages are concentrated mainly around the Sofia and Plovdiv agglomerations and in the territories favourable to the development of agriculture in the Central Danube Plain (Fig. 4).

### 6.3 Regional Features in the Depopulation Processes

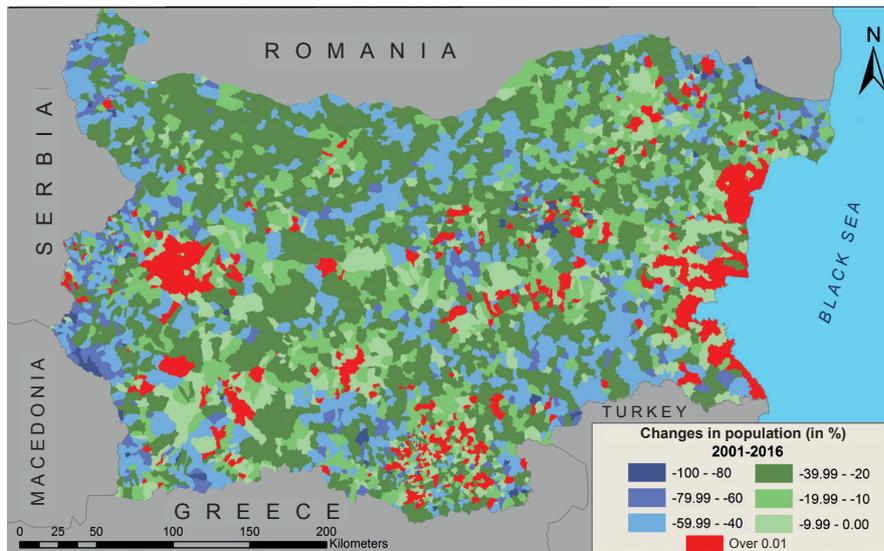
In the most general sense of the word, depopulation means decreasing the number of the population in a given territory. According to Mladenov (2014) "from a geodemographic point of view, depopu-

lation means a reduction to such an extent in the number and changes in the structures of the population in a given territory that it leads to the lasting impossibility of reproduction of the population in it. For one to speak of the depopulation of these territories or settlements, one must be able to observe an irreversible decrease in the population and a disturbed positive balance of real growth." The spatial expansion of depopulation can be revealed at different territorial levels, for which there are comparable data - settlements, municipalities, districts, and statistical regions. The scope of the territorial units also determines the degree of detail and fine points of the survey being carried out. In the present study the trends in the development of the depopulation processes and the structure in the changes in the number of the population are examined at the settlement level. Mladenov (2014) classifies depopulation by various signs: by reason; according to the degree and the strength of the event; by frequency of occurrence (once, repeatedly, or continuously); according to the duration of the event (short-term, medium-term and long-term); according to trends (declining, stable and growing); and according to policies. In characterisation of the degree and intensity of depopulation for the Bulgarian conditions, Mladenov (2014) adopts the following scale of the indicator, characterising the dynamics in the number of the population - relative change in the number of the population between the end year and the base year, measured as a percentage:

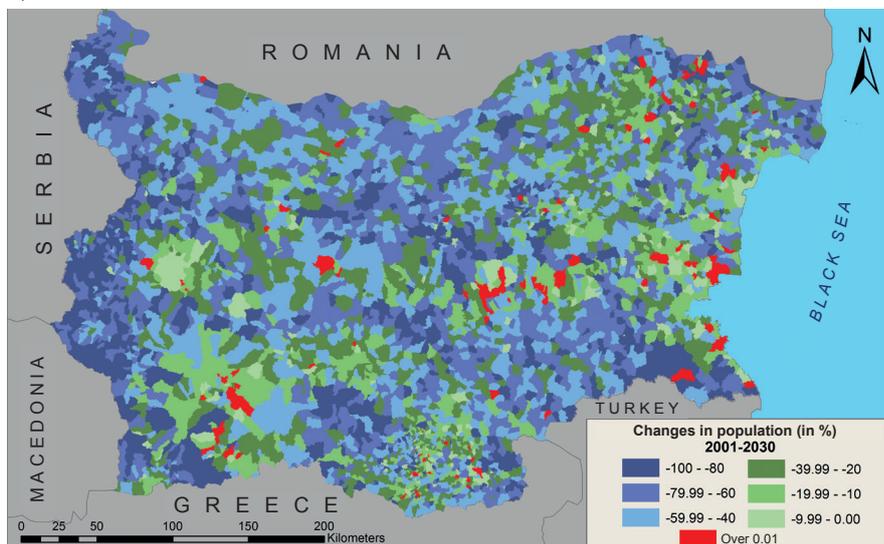
- low (population decline over a given period is below 10%);
- moderate (10% to 20%);
- strong (from 20% to 60%);
- critical (from 60% to 80%);
- irreversible (over 80%).

Fig.5. Changes in population by settlement (%): a) 2001-2016; b) 2001-2030

a)



b)



The ongoing demographic processes have a highly differentiated character in different parts of the country, although there are many common features. Significant regional disparities are observed in population dynamics by settlement. Most set-

tlements show a decline in population, although there are some exceptions. Large towns and large villages, which form nearly half of the settlements in this category, are distinguishable by their positive dynamics in the number of the population. In the

period 2001-2016, the most attractive places were the largest villages, which are concentrated around the Sofia and Plovdiv agglomeration, and boast a variety of features, as they are either located on the main urbanisation axes or have tourist centres, which are situated mainly along the Black Sea coast. These have reached the maximum population in the last four censuses. The medium-sized and small villages, which are characterised by population growth, are of two types: in one case, these are the settlements that were first affected by the depopulation process and reached the maximum number of rural population in 1934 or 1946, populated with Bulgarians, and that fall into the category of the smallest villages. In their case the insignificant increase in the number of the population leads to a significant increase with regard to percentage. In the other case, these are settlements with small or medium population, which are inhabited by Turkish and Roma population, in the recent past or are currently characterised by an expanded type of reproduction of the population, a maximum number of population reached in the last censuses, and which are located in the Eastern Rhodopes, the Eastern Balkan hinterland valleys and separate settlements scattered in the Ludogorie region. In the period 2001-2030 only 125 settlements (2.3% of the settlements) will be distinguished by a growth of population. By 2030, the villages, which will be characterised by positive dynamics, are scattered all over the country, and do not form compact areas. What they have in common is that these are settlements with specific features in the ethnic-religious structure: with a significant relative share of Turkish and Roma populations (the settlements located in the Eastern Balkan Mountains, Northeastern Bulgaria, the central and eastern parts of the Balkan hinterland valleys) and some settlements inhabited by Bulgarian-Muslim population (Western Rhodopes and along the River Mesta).

The destructive processes in the development of a settlement network are observed with different intensities in different parts of the country. Throughout the period in consideration, if we take into account for 2001, and for the final year of the period, 2030, the following features are observed with regard to the intensity of the depopulation processes (Fig. 5):

- **With a low (below 10%) and moderate (10% to 20%) population decline** over the period 2001-2016, 12.6% of the settlements stand out, and for the projected period (up to 2030) this group declines to 8.3% of the settlements in Bulgaria. In a spatial aspect, they cover the villages inhabited by the Bulgarian-Muslim population along the Mesta and the Western Rhodopes, the settlements with predominantly Turkish population in the Ludogorie region, Gerlovo and Slannik, the villages falling within the functional zone of influence of the big cities - Sofia, Plovdiv, Varna and Bourgas, and the villages located in the eastern and central Balkan hinterland basins. About one third of them belong to very large and large cities (over 100,000 inhabitants) and the very large villages (over 1000 inhabitants). Nearly half of them show a decrease in the population in a comparatively later period - from the beginning of the transition.
- **With a strong depopulation rate (population decline of 20 to 60%)** for the period 2001-2016 53% of the settlements can be distinguished, and for the projection period (up to 2030) this group decreases to 40.4 %. The category under consideration is the largest group, and is the closest to the average values for the country. This is the most widespread group, not forming a compact territory, as it is spread all over the country. It includes different categories of settlements in terms of number, ethnic composition, starting period of the depopulation processes, geographic location, and functions performed.
- **With a critical depopulation rate (from 60 to 80%)** for the period 2001-2016, 15.3% of the settlements are distinguished, and for the projection period (up to 2030) this group almost doubles in size and is close to ¼ (24.5%) of the populated areas. They are located in the earliest areas to be affected by depopulation processes (most settlements showed a decrease in their number even in the years before the Second World War), such as the border municipalities along the western border with Serbia and Macedonia, Sakar-Strandzha, the Cen-

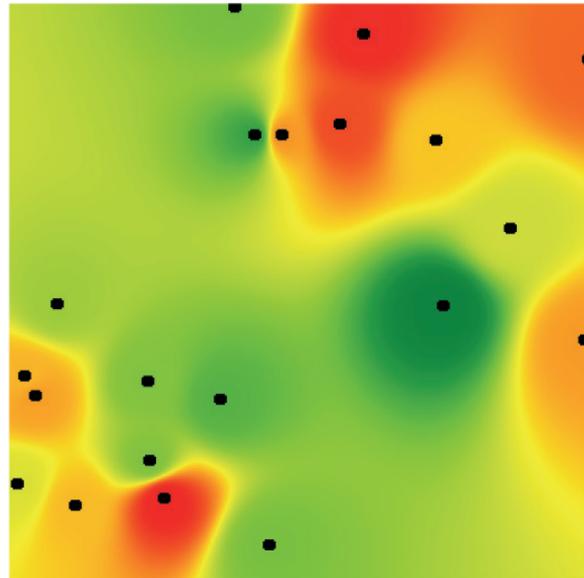
tral Balkan mountains, Southern Dobrudzha, as well as in the settlements with a high relative proportion of Turkish (Eastern Rhodopes) and Bulgarian-Muslim population (Western Rhodopes), as well as the border areas along the River Mesta. About ¾ of the settlements fall into the category of villages with the least population - up to 100 inhabitants.

- **With an irreversibly high intensity of the depopulation processes (with a decrease of the population by over 80%)** there were only 248 villages in 2001-2016, with this number growing almost six-fold, to reach 1,327 settlements (24.8%). by 2030. They are located in the earliest regions affected by the depopulation processes - the Kraishte region, the Central Balkan mountains, the Western Balkan mountains, the Osogovo-Belasitsa mountain range and the Sakar-Strandzha mountains. The majority of the villages belong to the group of very small settlements with depleted demographic potential, as well as those with a high relative proportion of Turkish population, which was involved in intensive emigration movements after the so-called great excursion in the 1980s, which raged after the Revival Process, and the continued momentum of emigration, especially during the last decade of the twentieth century. They are located in the Eastern Rhodopes and the area of Gerlovo, Slannik and Tuzluka. These settlements were the latest to be affected by depopulation processes and are characterised by the fact that they reached the maximum number of the population during the last census before the collapse of the socialist system - in 1985.

Each spatial study aims to highlight spaces with similar characteristics based on scientifically selected indicators. When implementing the boundaries of these territories the subjective factor grows in cases where no suitable statistical, mathematical, or geo-informational methods and approaches are used. In the present study, mapping of areas with the same intensity of depopulation processes was performed with the application of the "Inverse Distance Weighted" Instrument (IDW) in ArcGIS as a function of spatial analysis and vi-

sualisation (Fig. 6).

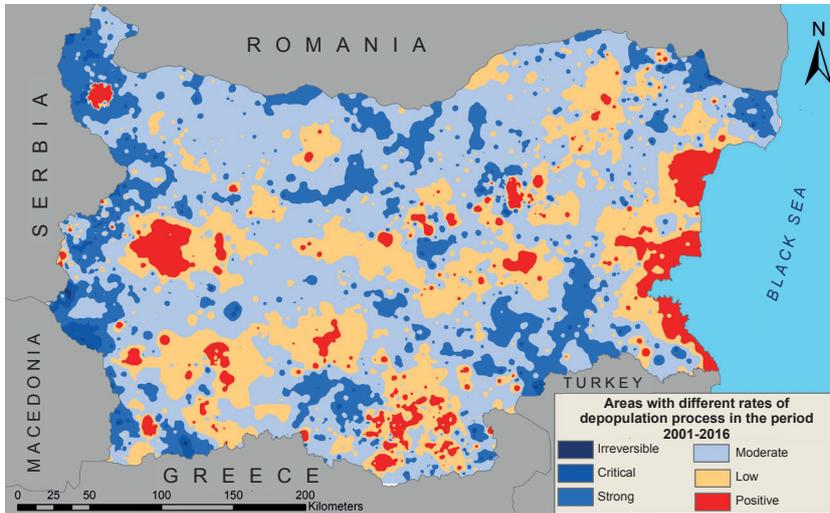
Fig.6. Examples of the Inverse Distance Weighted (IDW) function in ArcGIS



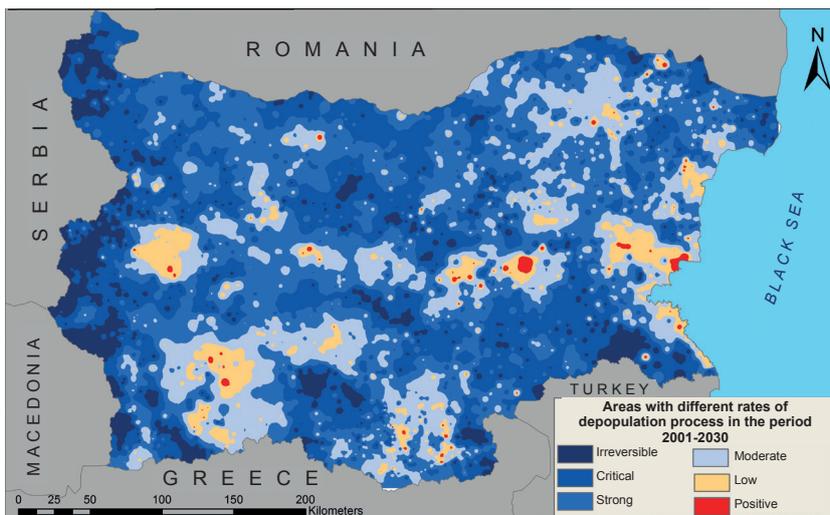
IDW is part of Spatial Analysis Tools and is an interpolation method by which the layer of point objects is transformed into a raster image. In this case, an object point (cell) refers to a populated place, and the values refer to the change in the population between the base year (1992) and the last year (2016) and 2030 for the projected period, expressed as a percentage. The allocation of the number of groups was not done for its own sake and corresponds to the target principle of the study. When setting the threshold values, the proposed numerical scale by Mladenov (2014), which reflects the differences in the intensity of the depopulation processes, was taken into account. The selected indicator is seen in a very complex relationship with fertility rates, mortality, natural growth, and external and internal migration. These indicators are influenced by the complex combination of political, economic, social, environmental, ethnic-cultural, religious, psychological, demographic, etc. factors. At different periods the factors are manifested in different proportions and degree of influence and determine the changes in the outlined areas with a different intensity of the depopulation processes. It is important to note that the areas formed are not sustainable in time and space and their boundaries change over the different periods.

Fig.7 Areas with varying rates of depopulation processes - a) 2001-2016; b) 2001-2030

a)



b)



Implementing the IDW tool in ArcGIS in the period 2001-2016, several areas with critical and irreversible depopulation emerge - Northwest, the Central Balkan Mountains and their northern foothills, the Sakar-Strandzha region, and the Kraishte region. In 2016 the areas mentioned occupied 22% of the territory of the country. In the following years there has been a significant increase in the areas of irreversible and critical depopulation, and in 2030 this is expected to occupy more than half of the territory of the country (Figure 7a). The Northwestern area is projected to grow in a northern and western direction, including parts of the

Western Danube Plain. The area of the Central Balkan Mountains and their northern foothills is expected to grow to the north and reach the River Danube. The most insignificant increase in area is in the boundaries of the southern region of Dobrudzha. The Sakar-Strandzha area will grow in a northern and northwestern direction, gradually including within its borders the Tundzha river valley and eastern and central parts of Sredna Gora. The territory of Kraishte will grow in a southern direction, and by 2030 it will include the Osogovo-Belasitsa mountain range and the Sandanski-Petrich valley (Fig.7b).

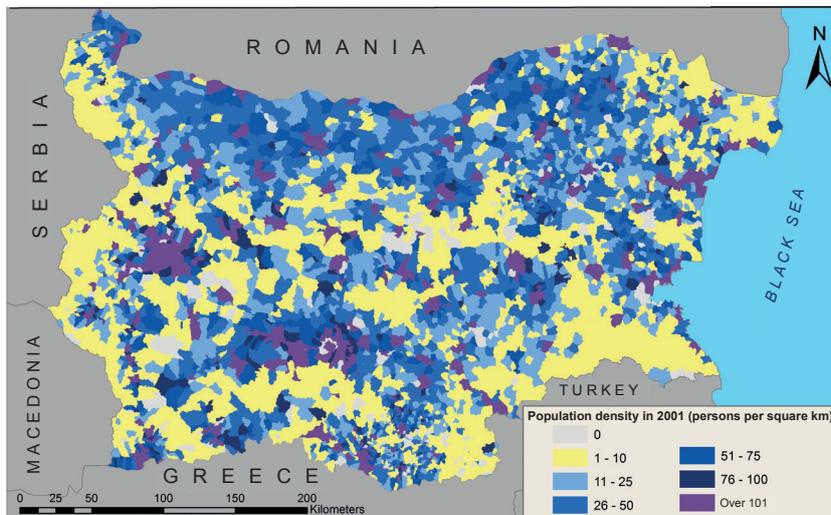
### 6.4 Population Density

The density of the population is directly dependent on the number and dynamics of the population over a given period. An alarming trend is not so much the reduction in population density as a whole, but its regional change. According to Tsekov (2018), the annual striking of dozens of villages off the National Register of Settlements leads to the desertification of large tracts of arable land that gradually turn into haphazardly self-planted forests and infertile land. According to the same author, the damage caused by the disappearance of viable rural communities, the abandonment and desertification of millions of acres of arable lands and valuable forests, the destruction of communal, transport, energy and

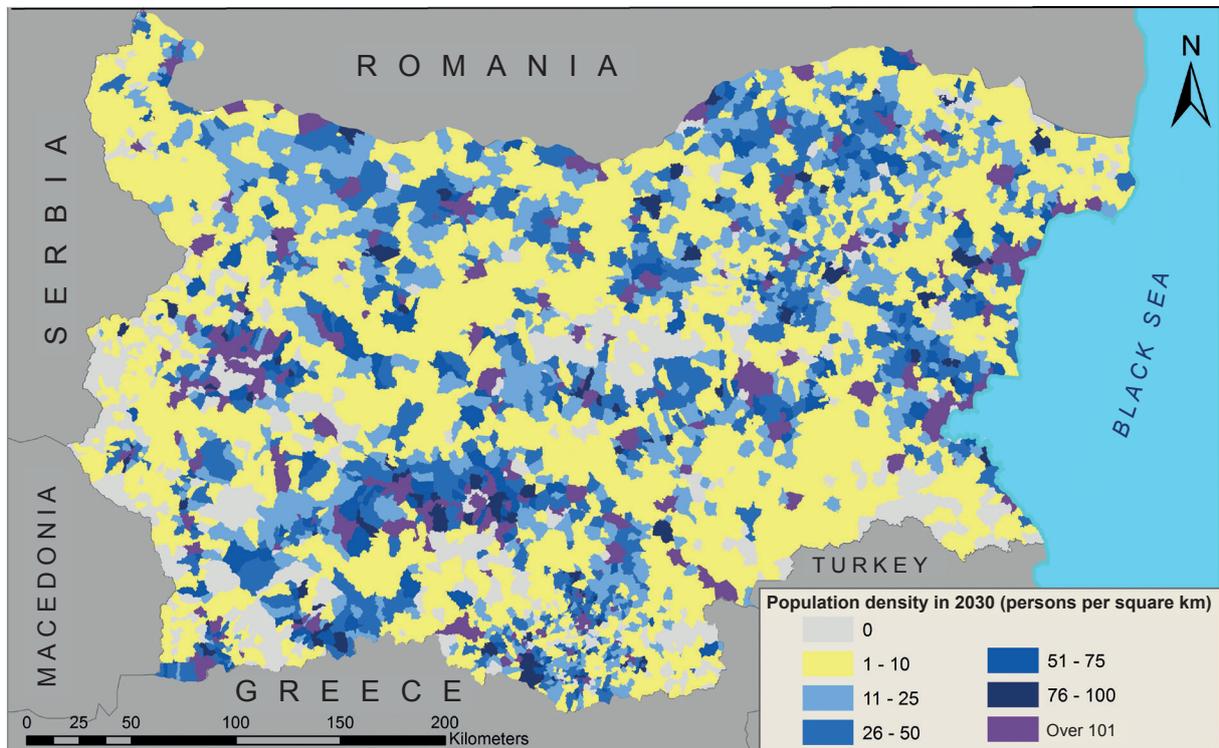
communication infrastructure in depopulated and deserted settlements, and the depopulating decomposition of the rural settlement network and loss of resources for agriculture and rural tourism are practically incalculable. The striking off of settlements and the reduction of the population lead to the emergence and expansion of so-called “demographic deserts”. According to Piñilla et al. (2006) this concept refers to territories where the population density is less than 10 people per square km. In Fig. 8a and 8b the territorial expansion of “demographic deserts” has been depicted. In 2016, territories with densities below 10 people square km covered 23% of the territory of the country. In 2030, as a result of the intensive depopulation processes observed, “demographic deserts” will occupy 59% of this territory.

Fig. 8 Population density by territory – a) 2016; b) 2030

a)



b)



### 6.5 Trends in the Changing of Age Structure

Among the many population structures that of age is considered to be the most important one in demographic theory. The decline in the population, due to low birth rates, rising mortality rates and a high-intensity negative balance in migration, has brought about serious changes in population structures. The latter have an impact on the labour market, healthcare, education, social care, etc. This structure is very important for present and especially future demographic trends, because it determines the future reproductive and labour potential.

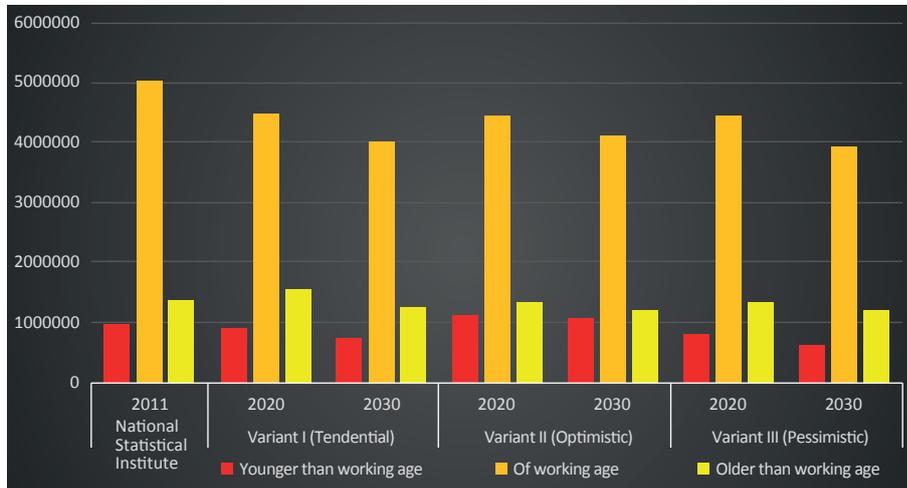
Aging of the population is one of the most acute demographic problems in EU Member States. Bulgaria is no different from other European countries, either in terms of birth rate and mortality, or in terms of the aging process. The widespread emigration processes, predominantly among the young age groups, contributed significantly to the deterioration of the age structure, leading directly to an increase in the relative share of the elderly among the population. At the same time, due to the increase in overall mortality and the slowing

of the increase in average life expectancy, the rate of aging of the population exerts a considerable pressure on the economy and social systems, and with each passing year this pressure will increase.

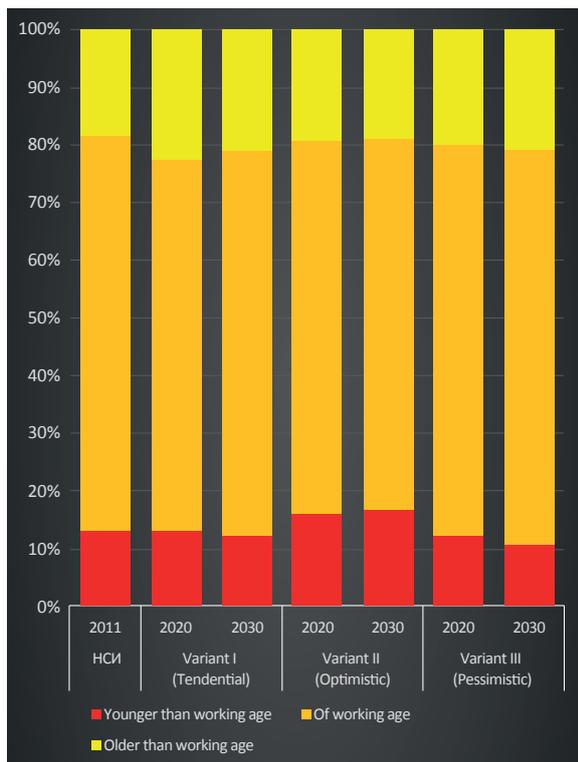
The relative proportion of the population younger than working age declined from 20.5% in 1992 to 14% in 2016 (for towns and villages from 21.5% to 14.3% and from 18.2% to 13.3% respectively). There was a significant decrease in the total number of the population of pre-working age (by 42.3%) over a period of 25 years. In 2016, the number of those able to work was 64.9% of the population of the country (in towns and villages 67% and 59.4% respectively). In absolute terms, compared to 1992, in 2016 the working population decreased by 2%. The proportion of the population older than working age in relative terms did not show any significant change: 23.7% in 1992, and 23.8% in 2016. In absolute terms, the proportion of the population older than working age declined by 27% between 1992 and 2016 (9.7% in cities and 42.5% in villages).

Fig. 9. Changes in the number (a) and relative proportion (b) of the population lower than working age, of working age and over working age (2011-2030) according to the three variants of the forecast

a)



b)



Negative demographic processes in the coming years will trigger a further deterioration in the age structure of the population and all the resulting negative consequences, mainly related to the inability to provide the necessary reproduction of human potential. The forecast of the population by age group

is made in terms of labour potential (lower than working age, of working age, and older than working age population) also in three variants. In all three hypotheses there is a decrease in the number of the population both of working age and over-working age, and this decrease is of varying intensity. The

greatest differences are observed in the category of those below working age, which is the result of the different predicted values of the fertility rate (Fig. 9).

**In the first variant (tendential)** there is a decrease in the number of the population below working age by 23.4%. In 2030, this will account for 12.4% of the population of Bulgaria. The working population is expected to decline by 1/5 and to reach 66.7% of the population. The population over working age will decrease by 8% but its relative proportion will increase at the expense of the working population by two points.

**In the second variant (optimistic)** there is an increase in the number of the population below working age in the year 2030 by 9.1% and their relative proportion will increase by three percentage points to reach 16.7%. The number of working population will decrease by 18% and their relative proportion will reach 62%. The share of the population over working age during the projected period remains unchanged at 19-20% and will decrease by 12 points.

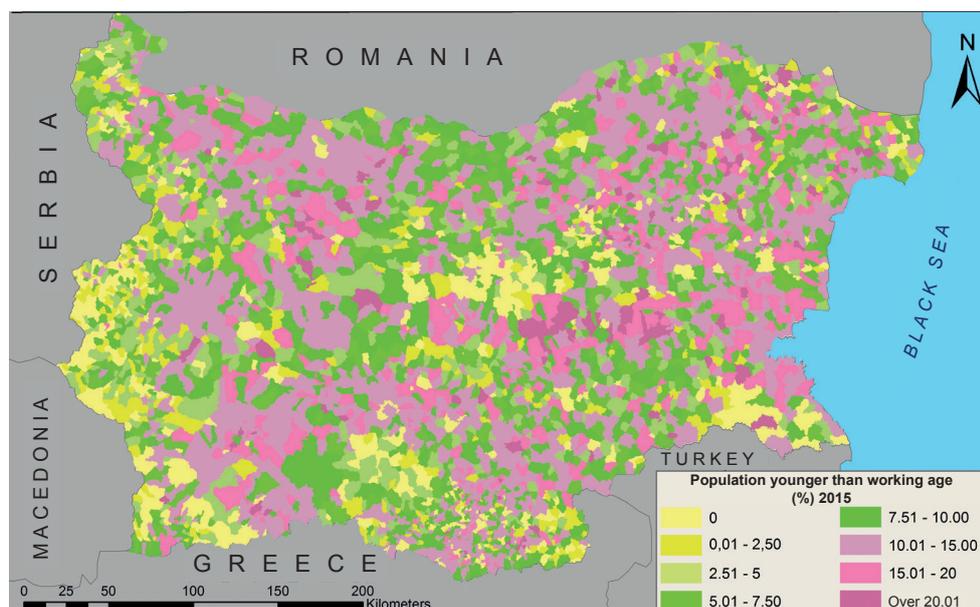
**In the third variant (pessimistic)** there is a decrease of both the absolute (by 36%) and the relative proportion of the population below working age by three points and this will reach 10.8% in 2030. The proportion of the working population remains unchanged, but the number will decrease by 12.5%. This version

of the forecast shows an increase in the relative proportion of the population over working age at the expense of the population below working age, reaching 22.7% of the population of the country.

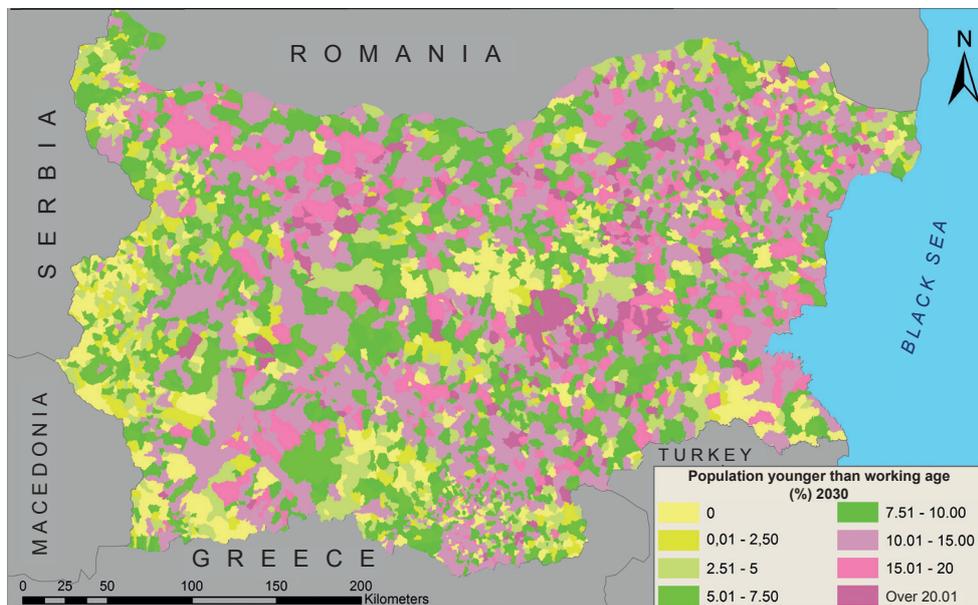
The decreasing number and relative proportion of population below working age is an indicator of the unfavourable future reproduction of the population naturally and leads to the intensification of the processes of depopulation and reduction in the number of work force. The negative demographic processes in the age structure, which are expected to intensify in the coming decades, are a serious restrictive factor for future developments and are indicative of many other problems. In 2015, 1033 settlements, or nearly 20% of the settlements in the country, experienced a lack of population below working age. By 2030, this category of settlements will reach 1170 settlements. If we add the settlements with a population of lower than working age that is up to 5%, this group of settlements formed 36% of the settlements in the country in 2015 and by 2030 it will reach 40% (Fig.10). Territorially, these settlements are located in the areas most affected by the processes of depopulation. In 2015 approximately 10% of the populated areas in the country had a relatively favourable age structure (over 15% of the population below working age). Up to 2030, no significant changes are to be observed in this proportion.

Fig. 10 Population below working age in 2015 (a) and 2030 (b)

a)



b)



**Conclusion 1:** Human capital, together with its quantitative and qualitative characteristics, can hinder or accelerate the development of a given territory. These tendencies acquire another interpretation when viewed in a spatial aspect, bearing in mind the specificities of a given territory.

**Conclusion 2:** The processes of depopulation in Bulgaria in rural settlements are seen to be much more acute than in towns. Significant territorial imbalances are observed in the occurrence of the processes observed, which leads to an even greater increase in polarisation in the demographic space. The influence of large cities on the demographic development of the surrounding settlements is highlighted. In most villages, extreme negative thresholds have been reached, which define the deepening unfavourable demographic trends in the future.

**Conclusion 3:** The trend of the population to be concentrated in medium-sized and large villages is continuing, as is the passing into oblivion of a number of small villages in the settlement network. The depopulation of many villages that are located mainly in the mountainous and peripheral areas has a number of negative consequences associated with serious difficulties in the development of these areas in the near future.

**Conclusion 4:** The depopulating and seriously aging settlements in Bulgaria face more than one demographic challenge, namely: the population falling below the "critical" demographic mass to ensure a future revival in order to avoid the expansion of vast areas threatened with total depopulation; reduction in the number of women of childbearing age, which is indicative of the exhaustion of reproductive potential; the reduction of the number of people below working age and of working age, which impedes the effective functioning of the labour market; the aging of the population also affects other functional systems such as healthcare, education and other social infrastructure, etc.

**Conclusion 5:** In Bulgaria, at the time of the survey, several heavily depopulated areas are emerging – the Northwest, the central Balkan mountain range and their northern foothills, the Sakar-Strandzha District, and Kraishte, for which the term "demographic deserts" is already used. In the pessimistic version of the forecast, these will continue to expand, and in 2030 and will exceed 50% of the territory of the country. As we know, demographics is known for its delayed effect (action taken today will produce results in 15-20 years!), So if we want to pre-empt this unfavourable picture, we must take direct action today.

## 7. Possible demographic and social measures / policies to improve the demographic situation in Bulgaria

In summary, we wish to reinforce our thesis that the world is going through an unprecedented demographic transition, with Europe at the forefront. Changes have always existed, of course; the theory of demographic transition outlines two of them in the earlier stages of human development, from archaic to traditional, from traditional to modern. The latter, in turn, is known as being veritable and passes through four phases. As a result of the changing technologies and means of communication, access to education and information and virtually unlimited travel opportunities, what is new about today is the dramatically changed demographic and reproductive patterns of people. Whereas, in the past, regardless of the socio-political systems of the time, there was always the patriarchal value system oriented towards the home, to the family and to more children (family models of having numerous children have always been characteristic of this), today there is an ever-greater stress on the consumer-materialist value system, oriented towards personal development, higher education, and the search for and justification of one's place in society. This drastically reduces people's reproductive attitudes and defines today's two-child, and even one-child model of families in the developed world. Here, we can add that as a result of industry and technology, there is an ever-decreasing need for parents to have more children to take care of them in their old age (so typical of all previous farming societies), and with increasing levels of education, it is normal for parents' expectations for the future of their children to be increased, nor should we forget the greatly diminished role of religion, which has always preserved the conservatism and patriarchal nature of a society. Of course, one of the most important factors for demographic change is the equal access that women receive today (again for the first time in history!) to education, realisation and participation in the socio-economic life of developed societies. And last, but not least, with the development of medicine, education and technology, there is a substantial increase in the welfare of societies, the standard of living, and care for people's health, which leads to a drastic and un-

precedented increase in average life expectancy, especially in Europe.

Against this background Bulgaria is quite normal in the demographic processes of the developed world, regarding birth rates and the process of population aging. The main difference between us and developed countries is in emigration. Not only do other developed countries not produce emigrants, they even attract such, as we continue to bleed in this sense, with a significant percentage of the most capable, educated and qualified members of our population leaving annually. Here the loss is even double because the state has invested funds and efforts in educating these people, and when they have to be realised and "give back" to society what they have received, they go abroad and work for other countries and societies (of course for themselves and their children!). That is why we will repeat our basic thesis - when talking about demography in Bulgaria, we must first of all talk about the retention of young people in our country. Even if they have a one-child or two-child family model, this will still contribute to the reduction of the negative demographic trends and slow down the most serious threats to the country's demographic crisis - the acute labour shortage, poor functioning of social systems, the ethnic change of the population and depopulation of vast areas of our territory.

We believe that the most urgent measures and policies that need to be implemented in demographic and socio-economic terms should be in the following directions:

- **Development of regional demographic policies with a clear emphasis on the underdeveloped parts of the country** and tailored to the specifics of the different regions, their demographic trends, the socio-economic environment, ethnic-psychology and the attitudes of the population, resources and traditions.
- **The gradual introduction of dual learning** with the idea of education being fully tied to the needs of the business and the labour market. Here, besides the necessary role of the state, it is imperative for businesses to invest in this form of education, by updating the ma-

terial and facilities, and the professional training of the teachers, ensuring that students have practice directly in the production cycles and providing jobs for those who finish with good grades. This triple effect is achieved, the business literally produces the personnel it needs, so we keep the young people in the country, we retain them in the respective regions, preventing the current migration to Sofia and several other big cities in the country.

- **Developing career guidance for children** from the first classes of secondary education, through specific and modern explanatory campaigns and conversations with trained and motivated mediators.
- **Establishing a much closer relationship between business and higher education**, mainly at master's level, which is much more flexible in terms of changes in curricula, providing traineeships, and with fewer students being trained, but with a clear professional orientation.
- **Developing a "silver" and "digital economy"** oriented to people over 50 years of age, with the clear goal of increasing their active lives and their participation in the social and production processes.
- **Financial stimulation and tax incentives** for families with two or more children, but with the mandatory introduction of the additional condition of a minimum educational threshold for parents (secondary education!).
- **Financial and social provision for single parents**, a type of parenting that is very common in contemporary developed societies.
- **Active work on the ghettoisation of the Gypsy population**, since ghettoisation constantly reproduces the current non-working model of their integration, and **compulsory improvement, and this to a drastic extent of their educational level**. According to expert estimates, the Gypsy population in Bulgaria by 2050 will amount to about 1,100,000 - 1,200,000 people or about 22-23% of the population of the coun-

try, which, at their current level of education, with only 0.5% having higher education, 9% having secondary education and over 90% with primary education or less, represents a threat both to social systems and national security. At the same time, with their young age structure, raising the level of education they could become a real reserve on the labour market.

- **Introducing the so-called "Icelandic model" ("Youth in Iceland")** to tackle school aggression and abuse of alcohol and drugs, in which 100% of students are engaged in extracurricular activities with sports or leisure activities connected with various arts, but certainly always on a team principle and with mandatory strict monitoring by the state.
- **Development of a proactive immigration policy** just as much to attract Bulgarians living abroad, as ethnic Bulgarians living in foreign countries and immigrants from other countries with the necessary educational and professional skills to actively participate in the labour market in Bulgaria and to significantly reduce the negative effect of the shortage of labour. Whatever the objections to immigration in a globalising world in which we already have mass shifting of the population might be, it is imperative that we adapt and take maximum advantage of our geostrategic position on the border with Asia and, at the same time, our membership of the EU.
- In any case, none of these measures will yield results without **the development of the economy and a REAL increase in the incomes of the population**. It is quite clear that with starting salaries of the order of 500-600 leva, there can be no retention of educated, qualified young people in the country. The long-maintained belief in our country that low labour remuneration will attract foreign investment is no longer working. Bulgaria is part of the EU and competition on the free market in it, and every person has the right to choose the best conditions for their life and realisation. Of course, here, in response to the draining of workforce, one can look for imports of a cheaper kind from South-east Asia. In an open market, this is not bad

but, before this, should one not seek ways and means of securing the future of the Bulgarian population in their country and only then think about importing workforce?

In conclusion, we would like to say that Bulgaria is in a very difficult demographic situation, but it

is certainly not hopeless, especially against the backdrop of the unique natural-climatic resources and traditions we have. What is necessary is a changing in viewpoint, a change in attitudes and focus, and very purposeful work, in order to turn the negative demographic trends into positive ones, and that in the foreseeable future!

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