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SUSTAINABLE URBAN DEVELOPMENT - THE 20 YEARS OF THE 21ST CENTURY - OPPORTUNITIES AND CHALLENGES

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ABSTRACT
Well-developed cities give people the opportunity for socio-economic progress as well as security in crisis situations. In the conditions of ecological, energy and pandemic crisis, the challenges of developing sustainable public relations during an unsustainable environment in large urban centers stand out even more strongly. A change in the priorities that municipalities follow is necessary. They should focus on the quality of life, safety and health of the residents, but with the use of smart technologies adequate to modern achievements. The facts accompanying urbanization are a serious argument for the search for long-term solutions for a sustainable urban living environment, especially in large cities. The purpose of the research is to emphasize the main policies and challenges affecting the quality of life in cities, as well as the opportunities for their improvement through smart technologies. City management should be transformed into an integrated management of the social, economic and environmental aspects of city life. Activities in the municipality can be understood as a partnership between politicians, administration, business and interested citizens. Integration can also be aimed in partnership with other cities in the country and in Europe. Sustainable financing oriented to long-term projects that contribute to overall economic development in a given area or region is needed.

Key words*:* sustainable urban development; smart cities; smart technologies; city governance.

INTRODUCTION

Well-developed cities give people the opportunity for socio-economic progress as well as security in crisis situations. In the conditions of ecological, energy and pandemic crisis, the challenges of developing sustainable public relations during an unsustainable environment in large urban centers are even more evident. Current urban planning creates environmentally incompatible priorities that lead to future challenges. Environmental problems, such as the increase in pollution, the increase in carbon emissions and the threat they pose to the climate, require trying to find adequate solutions. A change in the priorities that municipalities follow is necessary. You should focus on the quality of life, safety and health of the residents (1), but with the help of smart technologies, adequate to world achievements.

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A sustainable city is essentially a "smart" city that uses these technologies for a better quality of life. The creation of sustainable, green cities and communities is one of the UN's priorities given the increased urbanization and the challenges it poses to urban systems and governance. The construction of the "smart cities" of the European Union is planned for the program period 2021-2027 and it is an essential element of the "Green Pact". A significant part of the objectives and measures of the Green Deal can be implemented most effectively by local communities, which validate and analyze data on all risk and positive factors of urban governance. City management should be transformed into an integrated management of the social, economic and environmental aspects of city life. Activities in the municipality can be understood as a partnership between politicians, administration, business and interested citizens. Integration can also be aimed in partnership with other cities in the country and in Europe. Sustainable financing oriented to long-term projects that contribute to overall economic

development in a given area or region is needed (2).

The purpose of the research is to emphasize the main policies and challenges affecting the quality of life in cities, as well as the opportunities for their improvement through smart technologies.

METHODS

The facts accompanying urbanization are a serious argument for looking for long-term solutions for a sustainable urban living environment, especially in big cities:

• by 2030, almost 60% of the world's population will live in urban areas;
• 95% of urban expansion in the coming decades will take place in the developing world;
• 828 million people live in slums and the number continues to rise;
• rapid urbanization puts pressure on: fresh water supply, sanitation, living environment and public health,
• but high urban density can lead to increased efficiency and technological innovation while reducing resource and energy consumption

According to the Human Development Index (HDI), for a country to be developed (or its region or locality), achievements in three main aspects of human development are taken into account:

• life expectancy and healthy lifestyle;
• level of education, which is assessed according to the literacy rate of adults;
• standard of living – natural logarithm of GDP per capita in relation to purchasing power, in order to include elements of the quality of life such as mobility, access to cultural products, etc., which are not accounted for by the first two categories.

These basic conditions for sustainable social development require the overcoming of various challenges. It is important that these challenges can be resolved in a way that allows cities to continue to develop and grow, while improving resource use and reducing pollution and poverty, providing opportunities for all, with access to basic services, energy, housing, transport, etc. (3).

Although cities occupy only 2% of the Earth's surface in terms of territory, they contribute significantly to greenhouse gas emissions and, potentially, to climate change. In a study of Frontiers in Sustainable Cities (4) in 2021, compared to 167 cities worldwide, only 25 of the world's cities contribute to more than 50% of the world's greenhouse gas emissions. In front of it are the megacities in Asia. Australian and US cities also have significantly higher per capita emissions. Although Asian cities are a major contributor to pollution, greenhouse gas emissions per capita in urban areas are still higher than in urban areas. Of the 167 countries mentioned, 133 have set targets for the reduction of emissions, and 68 of them even include their complete elimination in the future. More than 50% of the world's population lives in cities and they are responsible for over 70% of greenhouse gas emissions. (5).

The United Nations Commission on Economic and Social Affairs identifies poorly planned urban development and pollution as the main challenges for the sustainability of cities, and aims at practices that improve the urban environment. (Goal 11 of the UN Global Goals for Sustainable Development by 2030) (6).

The Food and Agriculture Organization of the United Nations lists cities as consumers of 80% of the world's energy, which creates great harm to the surrounding environment. The future city must seek its sustainability, striving for a greater contribution to the environment, at the expense of the damage it inflicts on it. The interrelationships between ecology and all other spheres is undeniable, and this is the reason why the future is mainly oriented towards development and innovation to preserve nature and its resources (7).

Understanding the key influence of urbanization in the pursuit of sustainable development, in 2016 the UN adopted The New Urban Agenda 2016. Urbanization, which brings with it numerous social and economic problems, including poverty, ghettos, pollution environment, traffic jams, unemployment, crime and violence, poses a threat to the environment as well. As cities grow, they gobble up valuable agricultural land. Expanding cities seal this fertile soil with concrete and asphalt. Rainwater cannot soak into it and this leads to flooding. Biodiversity is destroyed and the soil no longer absorbs carbon. Soils that took thousands of years to form can be destroyed in minutes (8).

The EU made three voluntary commitments to implement the UN's New Urban Agenda in 2016, which have already been implemented. In 2022, on the occasion of the UN high-level

meeting on the implementation of the UN's New Urban Agenda, the EU and its Member States renew the three voluntary commitments made six years ago at the Habitat III conference:
• implementing a renewed EU Cities Agenda (9) to continue to promote multi-level governance and improve the urban dimension of EU policies.
• promote the use of the degree of urbanization, proposed together with partners, as a new global method for aggregating sub-national urban data. This method will be supported by tools for its use for wider comparability, better measurement and reporting of the implementation of the Sustainable Development Goals (SDGs) at the local level.
• expanding the International Program for Urban and Regional Cooperation (IURC) (10), which supports cooperation between cities and regions worldwide to work on sustainable solutions to common urban challenges, in particular for the green and digital transition and for recovery.

During the meeting, the EU and its member states also announced three new voluntary commitments that focus on:
• strengthening support for external cooperation and international partnerships. Under the Global Gateway and the external dimension of the European Green Deal, the EU will significantly increase its commitment and support for integrated sustainable urban development in EU partner countries, including improving access to financing through the European Fund for Sustainable Development (EFSD+) and for greater coordination, scale and impact across Team Europe initiatives.
• supporting the European Mission for Climate Neutral and Smart Cities and 100 European cities to act as centers of experimentation and innovation for green, digital and inclusive transformations. These cities will serve as models for cities around the world through initiatives such as the Global Compact of Mayors (11).
• to initiate a global transformation of citizens' lives in an innovative and human-centered way through the New European Bauhaus (12) - a cultural movement inspiring green transformation. This initiative aims to design sustainable spaces for all and improve the living environment (13).
In 2016, the EU committed to deliver the New Urban Agenda through the EU Urban Agenda (UAEU) (14). URBACT (15) is a European exchange and training program promoting sustainable urban development that integrates economic, social and environmental dimensions. This enables cities to work together to develop new, pragmatic and sustainable solutions to major urban challenges, confirming the key role they play in addressing increasingly complex societal changes. URBACT will continue to enable European cities to work together in 2021-2027 through transnational networks, capacity building and knowledge sharing activities.

The European Union launched the International Urban Cooperation (IUC) Program in 2016 (16) and is adopting a second phase from 2021 to extend the program to regional authorities and additional countries. The International Urban and Regional Cooperation Program includes cooperation on common urban and territorial challenges, paying particular attention to green and digital transitions and inclusive post-pandemic recovery, namely by pairing the EU with non-EU partner cities or regions to share knowledge and best practices. Cities and regions will cooperate in three thematic networks:
• ecological transition and green deal;
• urban and regional renewal and social cohesion;
• innovative sustainable and carbon neutral ecosystems and strategic sectors (17).

In 2021, the European Committee of the Regions (CR) noted the lack of explicit and transparent reference to the UN Sustainable Development Goals in many national recovery and resilience plans. The CR underlines that the COVID-19 pandemic shows the importance of sustainable development and that the Sustainable Development Goals (SDGs) can help develop a coherent and comprehensive vision within Next Generation EU (18). The current pandemic and the expected economic, social and environmental consequences clearly show an urgent need to support the "localization" of the SDGs so that recovery can be more equitable and future health crises can be avoided.

Western Europe has a better record of fighting poverty than Southern and Eastern Europe. Bulgaria is significantly behind in the implementation of most of the 17 UN Sustainable Development Goals by 2030. In the

fight against poverty, the quality of education, justice and the strength of institutions, our country will have to make many more efforts. Much below the EU average, Bulgaria also manages in terms of the development of industry and innovation, as well as in reducing inequality in society and providing clean drinking water and water purification (19).

Bulgaria is in penultimate place among the EU countries in the UN report on the progress on the sustainable development goals for 2020 (20). The global goals of the UN are present in the National Development Plan of Bulgaria 2030, adopted at the end of 2020. A lot is laid there mainly because the goals were adopted in 2015, and until 2020 there is no program document to show that the goals are important to us. According to the latest index and the progress report on the EU's sustainable development goals, Bulgaria is in 33rd place out of 34 countries in the picture of Europe (21).

In the Monitoring Report on progress towards the SDGs in the context of the EU, 2020 edition (22), Bulgaria reports almost no progress on most of the goals. Certain progress can only be made on goal 15 - Conserving, restoring and stimulating the sustainable use of terrestrial ecosystems, sustainable forest management, combating desertification and halting soil degradation, and proceeding with its regeneration, as well as halting the loss of biodiversity. Romania reports progress on one more goal 7 - Guaranteeing access to financially affordable, reliable, sustainable and modern energy for all, but unlike Bulgaria, it is moving away from achieving goals 4 - Ensuring inclusive and equal quality education and stimulating opportunities for lifelong learning for all, and 10 - Reducing inequality within and between countries where our country is making progress. There are countries such as Austria, the Netherlands, Ireland, Sweden and Finland where no progress is reported on only one or two indicators.

The economic, social, environmental and health problems that are the basis of sustainable development and quality of life cannot be solved without the help of scientific and technological achievements. The introduction of smart technologies into the life and management of society are enshrined in the National Plan for Recovery and Sustainability of the Republic of Bulgaria (23) from 2022, which is structured around four pillars: innovative Bulgaria, green Bulgaria, connected Bulgaria and fair Bulgaria. The plan includes measures in areas such as the decarbonisation of the economy, education and skills, research and innovation, smart industry, energy efficiency, sustainable agriculture, digital connectivity, social inclusion and health. The projects in the plan cover the entire life cycle of the Recovery and Resilience Mechanism until 2026. Regarding the third pillar – connected Bulgaria, the efforts are aimed at digital connectivity and BGN 2,469 million are planned; the transport connectivity and possibility to develop 12 projects; local development, which will require 10 reforms. For the deployment of a large-scale digital infrastructure, BGN 527 million is planned to be spent on:

• increasing the cyber security of the administration in all 265 municipalities;
• construction of high-capacity Internet networks in small settlements for 350 thousand people;
• construction of high-speed Internet in 24 higher schools.

BGN 101 million has been earmarked for digitization of Bulgarian Post and provision of complex services. Expansion of electronic management will be financed with BGN 213 million. BGN and includes:

• digitalization of justice;
• introduction of e-health diagnostic database;
• wide-ranging digitization of 86,000,000 pages of register data and audiovisual, museum, library and archival data;
• a platform for electronic administrative services by territorial organization, incl. building permits.

In the plans of all EU countries, the criteria are respected - at least 37% of the costs are aimed at the green transition, and at least 20% - at the digital transformation. With an EU average share of 43%, Luxembourg (60%), Denmark (58%) and Malta (54%) foresee the greenest investments as a share of their plan, and the lowest share is foreseen by Latvia's plans (37%), Greece and Portugal (38% each). The digital transition is most strongly embedded in the plans of Germany (53%), Austria (40%) and Ireland (32%). Digital initiatives are least reflected in the plans of Latvia, Croatia, Romania and Slovakia (20%), with an average share for the EU of 28% (24). Bulgaria directs the most expenditure to the green transition and the least to the digital transformation, which

shows that investment intentions for digital connectivity will again be under-fulfilled.

But for the development of cities and their infrastructure, digital technologies have a key role. Some important elements will help make them more sustainable:

• Sustainable energy networks - transition to distributed, automated and remotely controlled energy systems. Micro grid infrastructure, where small, independent electricity or heat networks distribute locally generated energy to nearby customers, can provide constant power even if the main electricity grid has a problem.

• Sustainable water supply - within the framework of the smart city, smart water networks are equipped with optimized water distribution systems, which are characterized by lower energy consumption. Using sensors and other technologies, disturbances such as leaks can be identified quickly or even predicted, reducing water loss. Data generated in the distribution network can be used to monitor trends and make accurate predictions to ensure that people have access to water when they need it.

• Sustainable transport systems - modern technologies open up huge opportunities for optimization of public transport in cities. Intelligent mobility systems can help reduce congestion, centralize public transport payment methods and minimize health and environmental impacts caused by emissions. With a smart transport infrastructure, cities can make their public transport routes more efficient, meeting the needs of their passengers while being kind to the environment.

• Sustainable buildings - They consume 40% of energy worldwide and offer a wide field of action in the direction of reducing emissions. Intelligent management of equipment in the building ensures that lighting, heating and ventilation are turned off in unoccupied areas of the office and reduces energy consumption.

• "Sustainable" thinking - However, none of the technologies listed above could become a game changer in the fight for sustainability if they were not supported by a fundamental change in the way people, businesses and communities live, work and perceive the world (25).

The centralized system of urban planning in Bulgaria requires institutional commitment to new initiatives. Active civil society and the initiative of professional organizations are essential to build a sustainable environment for urban planning adequate to the needs of cities (26). It is important that digital transformation is combined with an expert approach to problems.

The management of large cities paradoxically combines decision-making in situations with too many unknowns, risk-taking, experimentation and innovation, and on the other hand - maintaining relative stability, predictability, control and accountability. These cities can most successfully deploy technological advances to find resilience in an unsustainable system. For more and more people, quality of life includes factors beyond economic satisfaction and satisfied material needs. Nature, aesthetics, public spaces, diverse cultural life are part of the new paradigm for a good life in the city. The COVID-19 pandemic shows the extent to which urban policies are a function of changes in the global system and its complex environment, where the local cannot be separated from the global (27).

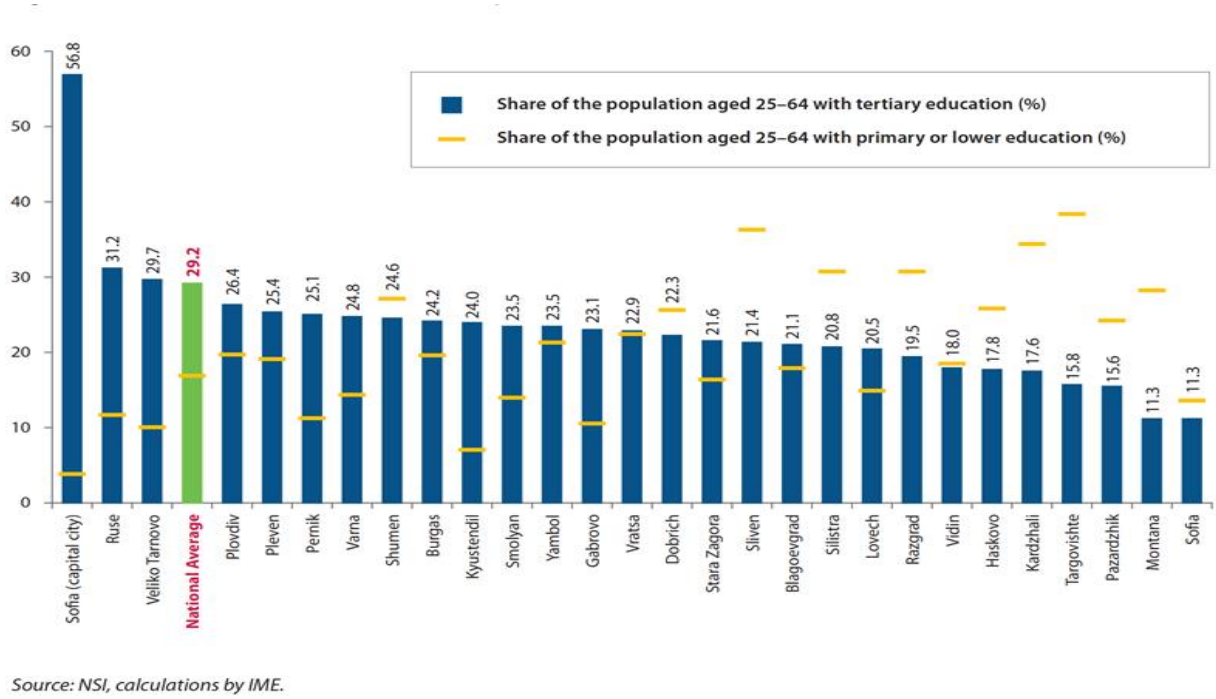
The goals for sustainable urban development are multifaceted and the responsibility for them lies with the competence of the rulers, as well as with the initiative of civil society. For there to be a positive development in this process, the public and private sectors must work together. At the local level, this cooperation is extremely useful. These key features of Sustainable Urban Development (SUD) are maintained during the 2021-2027 programming period, for which it is proposed to increase the minimum ERDF percentage to be allocated to SUD to 6%. Strategies in urban areas will be promoted through an integrated and locally oriented approach to territorial development, where integration is the product of multi-sectoral policy, multi-level and multi-stakeholder governance, as well as a multi-territorial and community-led strategy (28).

The regional map of economic development in Bulgaria continues to be dominated by large economic centers. The positive dynamics of the labor market in Bulgaria has been disrupted due to the pandemic situation. After the employment rate of the population aged 15-64 exceeded the 70% limit (2019) for the first time in the recent history of the country, in 2020 a contraction of employment to 68.5% was recorded, with negative processes covering all regions of the country. But the large disparities in the labor market have not been affected by

the pandemic: the big economic centers are once again leading the way and report an employment rate of around or above 70%, while the poorer ones lag far behind. The ongoing waves of the coronavirus and the resulting restrictions on social life and economic activity put new jobs at risk.

RESULTS

Human capital and the workforce profile will be key to the recovery process and continued transformation of the Bulgarian economy. Nearly 30% of the workforce (ages 24–64) has a university degree, and this share has been rising in recent years. (Fig. 1) The majority of this workforce is concentrated in Sofia - 56.8% of the workforce has a higher education, followed by Ruse (31.2%) and Veliko Tarnovo (29.7%), which traditionally perform strongly in this indicator. In almost half of the regions in the country, the share of people with primary and lower education in the workforce is greater than the share of university graduates. The share of people with primary and lower education remains too high in the regions of Targovishte, Sliven, Kardjali, Silistra, Razgrad, Montana and Shumen (29).



Source: https://www.regionalprofiles.bg/var/docs/Reg_profiles_2021_EN_c.pdf, p. 12

Figure 1. Educational structure of the workforce by districts in 2020

In the year of the pandemic, regional centers lost population, while peripheral municipalities registered an influx of residents. In 2020, all major cities led by Sofia, Plovdiv and Varna reported an outflow of population. At the same time, a total of 205 municipalities recorded positive mechanical growth, which is unprecedented in the recent history of the country. Despite this correction brought about by the pandemic and restrictive measures, the long-term demographic trends remain rather unchanged, with strong economic centers in the best position to attract young and active people, and the digitization of the population continues to be an important challenge. The digital skills of the population in Bulgaria can also be seen from the data in the Index for the penetration of digital technologies in the economy and society (DESI) and, in particular, from the results of the country in the field of human capital. In this area, with a score of 32.7%, Bulgaria ranks last among the EU countries, for which the average score was 47.1% in the last edition of the index from 2021 (30). The huge difference is in the share of the population with at least basic digital skills. For Bulgaria, it is 29% in 2019 and has not changed in the previous three years, while in the EU it reaches 56%. 11% of Bulgarians have more than basic digital skills compared to 31% in the EU. The share of ICT specialists among the employed between the ages of 15 and 74 in the country is 3.3% in 2020 - also relatively low compared to the EU (4.3%), but the share of women among them is significantly

higher - 28% at 19% in the EU. Another problem is that companies in Bulgaria still face difficulties in finding a workforce with digital skills, but at the same time they do not qualify their staff. The share of enterprises in our country providing ICT training in 2020 is 7%, while in the EU it reaches 20%. The share of those completing higher education in this field continues to grow and even surpasses the European average - 4.0% in Bulgaria, compared to 3.9% in the EU. In the secondary professional education, a serious growth is also visible and in the academic year 2021/2022, the share of accepted students in ICT specialties from the general admission plan reaches 17% or over 6 thousand students. A large part of the trainees is in the field of programming and in particular the professions "Programmer", "System Programmer" and "Applied Programmer" - a total of 2 thousand for the three specialties, with the largest number of places concentrated in the capital and the regions of Plovdiv. Varna, Burgas, Blagoevgrad.

In 2021, nearly 30% of the workforce (aged 24– 64 years) had a university degree, a share that has been rising in recent years; The unquestioned leader is Sofia (capital city), where 57.7% of the workforce have higher education; Next come the districts of Ruse (30.9%), Varna (30.2%), and Veliko Tarnovo (28.6%).

CONCLUSION

Improving digital skills in Bulgaria is a priority of several programs and strategic documents such as the National Development Program "Bulgaria 2030", the Lifelong Learning Strategy, the Employment Strategy 2021-2030, the National Program "Digital Bulgaria 2025", the Strategy "Digital Transformation of Bulgaria 2020-2030" (31).

The most advanced digital economies in the EU, according to the 2021 DESI ranking of Member States, are Denmark, Finland, Sweden and the Netherlands, followed by Ireland, Malta and Estonia. Romania, Bulgaria and Greece have the lowest DESI scores.

At the end of 2021, despite another wave of the pandemic, attention is focused on restoring economic growth and changing the regional map. The technological and structural transformation of the industry, including changes in supply chains as well as the penetration of digital services continue to be the leading factors for development in places. The big challenge to growth is investment, which still remains depressed by the uncertain economic and political environment. The strategic planning of municipalities for the period 2021-2027, as well as the efforts of large economic centers to attract investors and develop industrial areas can play a positive role and support the transformation of the economy. In these efforts, municipalities need support and, above all, real steps for financial decentralization.

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